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COVER: New extension of Southern State Parkway near Babylon, Suffolk County, New York, looking east. Stone-faced bridge carries Deer Park Avenue over the new parkway, with cloverleaf intersection.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Right: St. Paul's Traffic Engineer, Maurice W. Hewett and Traffic Superintendent Arthur W. Stattman and a Dual.

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Frankly Speaking

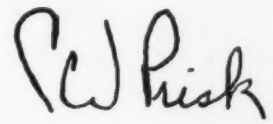
THE transportation problems of World War II taught the traffic engineer many valuable lessons. One of these, by its absence from current literature and practice, seems on the verge of being forgotten. I refer to the wartime staggered-hour plans that boomed the operating efficiency of badly overloaded streets and highways. The critical travel needs during that difficult period made it abundantly clear that our city streets could not possibly accommodate at one time the entire peak traffic load of the working population. Community-wide plans were devised for staggering employment hours so that traffic peaks would be lowered and extended in duration.

The eminent success of this wartime step, in which the traffic engineer played so prominent a part, can hardly be questioned. But the wholesale readjustment in population and in working habits during the post-war period has in effect, thrown the old staggered-hour plans in the trash heap. A fresh start is needed.

Traffic engineers are presumed to be expert in planning the best use of time and space on streets and highways. Space efficiency is continually on the gain, what with parking bans to eliminate a handful of curb-side vehicles so that hundreds more may have the space for movement, the establishment of one-way streets to handle 15 to 50 per cent higher volume than conventional two-way streets, and the assembly and dedication of unused space off-street for parking purposes. In fact, present conditions in our city centers suggest that the ultimate in "space" efficiency is being approached.

But this neglected dimension of "time" efficiency remains as a bright opportunity for developing added street capacity. The trend toward greater and greater use of the private automobile, even in the face of severe congestion, seems unreversable and if present trends are accepted as the barometer, mass transit patronage can hardly be expected to soar high enough to ease even today's street stretch and strain, to say nothing of tomorrow's problem.

Why not take a little time for a second look at the staggered employment hour principle?



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Traffic and Highway Planning for the New York-New Jersey Metropolitan Area

New York City's Arterial Program

By Robert Moses

City Construction Co-Ordinator, New York City

Through the courtesy of the editor of "Traffic Engineering," the New York Metropolitan Section of the Institute of Traffic Engineers has arranged for a series of articles commenting on the development of various highway and traffic agencies in the New York-New Jersey metropolitan area and describing some of their significant projects. These articles, appearing in the June, July and August issues of the magazine, will point out the coordination which has been necessary in order to provide a comprehensive highway system in this area. It is hoped that publication of these articles will also stimulate interest on the part of those attending the Twenty-first Annual Meeting of the ITE, to be held in New York from September 24 to 27, 1950, so that the delegates will take the opportunity to visit and inspect some of these projects which may provide ideas helpful in meeting their own local problems.

NEW YORK CITY'S current arterial program, including projects financed with City, State, Federal and Authority funds, runs to a total of approximately half a billion dollars. Having built a considerable mileage of parkways restricted to non-commercial vehicles, we have now shifted the main emphasis to expressways serving all kinds of mixed traffic, and have applied to them many of the principles and much of the experience gained in parkway construction. It was logical that initial efforts should be concentrated on parkway construction as over eighty per cent of the traffic consists of passenger vehicles.

Design of parkways has been immeasurably improved since the early days of inadequate rights of way and narrow strips of pavement in the center, scenic railway thank you ma'ams, and over-ornamented Gothic bridges. In 1925 the Bronx River Parkway was finally completed from Bronx Park in New York to Kensico Dam in Westchester. It had taken eight years of litigation and thirteen years of building, and was the marvel of its day. I would not withhold any of the credit given to those pioneers who dreamed of and created this first metropolitan parkway; yet today this artery, although still indispensable, is so obsolete that we are rebuilding the section from the City line to the Cross County Parkway and planning a new alternate route through the Sprain Valley as a substitute for the original Parkway which could be modernized only by completely tearing out all the old bridges, roadways and much of the landscaping.

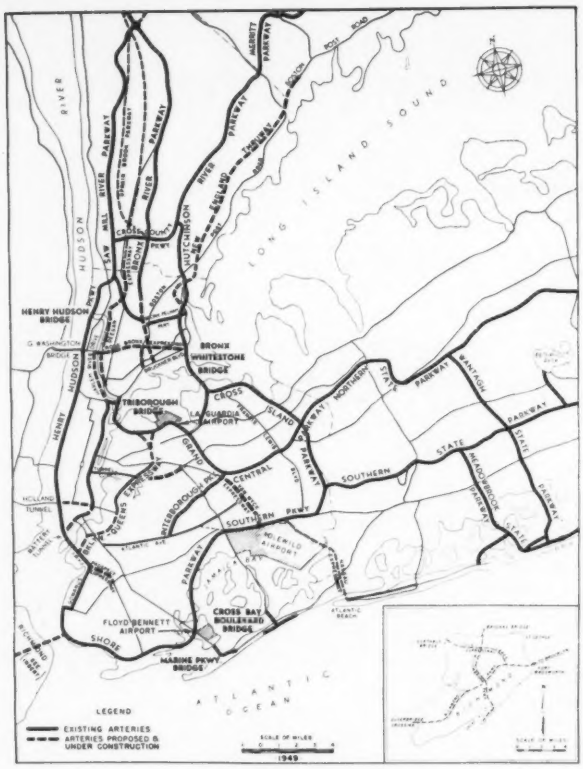
The completion of the Bronx River Parkway and general public realization of its beauty and usefulness, plus the beginning of assembly line car output, gave enormous impetus to our metropolitan parkway program, and in a short time the Westchester and Long Island suburban systems were designed and built in the face, however, of considerable scepticism and opposition. In 1929 the Board of Estimate of New York acted, at the request of the State, to acquire title to the Grand Central Parkway, to carry traffic of the Northern State Parkway westerly into the midtown area.

Today, our parkway program is approaching completion. In the City, the great Belt swing around Brooklyn and Queens, opening meadow lands untouched since the days of the Canarsie and Rockaway Indians, connecting with the Whitestone and Triborough Bridges and the Brooklyn-Battery Tunnel which has just opened to form with the Henry Hudson and Hutchinson River Parkways a ring around the entire City, green with landscaping by day and gold with sodium lights by night. The inner spokes of this giant wheel are fashioned out of the Grand Central and Interborough Parkways and the Queens Midtown Tunnel to Manhattan, and more spokes are now under construction.

A System To Meet Community Needs

This system provides a convenient and easy means of travel for the casual traveler and for the everyday commuter who journeys between the great business and industrial centers of the City and the large residential areas both within the City and the surrounding suburban communities. It also connects with many recreation areas, including fine beaches, golf courses, picnic and camping grounds. Traffic peaks during the week are generally reversed over weekends as the motorist takes advantage of the recreation facilities constructed for him in the suburbs.

With the parkway system as a broad pattern, Federal, State and City plans for a comprehensive system of City expressways to serve mixed, as distinguished from restricted pleasure and passenger traffic, were pushed during the war years. When peace came, specifications were ready, complex design and right of way problems had been solved, machin-



New York Metropolitan Arteries

ery established to insure cooperation and concentration of authority, and construction contracts let as fast as funds became available, people moved, and sites cleared.

In designing the limited access arteries particular attention has been given to the needs, protection and improvement of communities through which they pass. Facilities for both passive and active recreation are provided along the borders, and where normal street crossings do not take care of pedestrian needs satisfactory overpasses or underpasses limited to pedestrian use are provided. Other City improvements, such as housing and airports, are keyed into the arterial system.

In addition to normal pre-war difficulties, we now have the problem of tenant relocation. No longer is it possible to acquire property, send out notices of evictions, and then demolish buildings. We must find homes for the tenants in the way of public improvements. Two laws have been passed making possible the relocation of houses and the rehabilitation of deteriorated buildings to provide the new homes. As an illustration, on Van Wyck Expressway 260 houses and a 35-family apartment were moved. On other projects, old boarded-up buildings have been acquired and rehabilitated for use by families affected by the expressway program. Other means of relocating families have been devised. In short, every possible expedient, designed to bring about the relocation of families in a humane and decent manner, has been brought into play.

It will be noted on the accompanying map that the arterial program now under way embraces all five boroughs of the City of New York. These projects, most of which are expressways, together with the completed parkways form a unified network tying together the main arteries of the Greater City, Long Island, Westchester and New Jersey. Those of us who, in one capacity or another, have been working on this metropolitan arterial objective for almost a quarter of a century have never had any illusions from the beginning about the tremendous task before us. The need of these modern arteries of travel has become increasingly urgent as commerce and travel have more and more taken to the roads, as cars multiply and our entire civilization runs on wheels. To delay this program would be an inexcusable civic and official blunder. We need only imagine the intolerable conditions which would exist today if our program had not been pushed forward vigorously in the last two decades, and if we reflect on the penalties we now face due to the interruption of construction during the war.

Cooperating Agencies

Today we are well on our way toward the solution of this problem in the metropolitan area. Numerous construction agencies of government, Federal, State, City, County, Towns, Village and, of course, Public Authorities, have cooperated to bring about this achievement of democratic enterprise. These agencies have, generally speaking, avoided competing with each other and have applied their energies to the specific parts of the program for which they are directly responsible. Special mention should be made of the part played by the five Borough Presidents of the City, each of whom is involved in the mapping, design and construction of substantial portions of the program. The State Department of Public Works has been particularly cooperative. Much of the work is being done under its supervision. The Federal Public Roads Administration, which must approve all work on which Federal Highway aid is used, has been sympathetic and helpful in solving the problems inherent in this complex program. Other agencies, including the City Planning Commission, Park Department, Department of Water Supply, Gas and Electricity, Board of Transportation and the Public Authorities have been helpful and finally, without the complete support of the Mayor and Board of Estimate, including its Chief Engineer and Director of Real Estate, this program could not be carried out.

Pedestrian Protection

The pedestrian has rights too!

If you're the person behind the wheel, you must remember that the person on foot has the right-of-way over automobiles in some instances. Yet accidents involving pedestrians account for one-third of the traffic deaths in this country every year.

Keep in mind the following when driving:

(1) When pedestrians are crossing at unsignalized intersections, drivers must give them the right-of-way if they are walking within any crosswalk.

(2) When pedestrians are crossing at signalized intersections they should obey signals but drivers turning right or left must yield the right-of-way to pedestrians crossing on the "green" or "walk" light.

(3) Be alert for pedestrians crossing between intersections, particularly at night, even though the walkers may be at fault.

The Long Island State Parkway System

By Sidney M. Shapiro

Deputy Chief Engineer, Long Island State Park Commission, New York

THE Long Island State Parkway System in the Counties of Nassau and Suffolk is under the jurisdiction of the Long Island State Park Commission of which Robert Moses is President. The State Department of Public Works cooperates with the Commission on parkway construction and in most cases work is progressed under contracts awarded by the Superintendent of Public Works. The Park Commission acquires rights of way, makes development plans, approves details of design and construction and after completion maintains and polices the parkways. The Causeways from the mainland to the other barrier beach are planned, constructed and maintained by the Jones Beach State Parkway Authority which is a board with power to borrow funds by the issuance of bonds or otherwise and consists of the members of the Long Island State Park Commission.

To date 97 miles of the 130 miles planned have been completed, as shown on the map (p. 382). Construction of the sixteen miles which will unite the Northern, Southern and Ocean Parkways in Suffolk County is now underway. All contracts are being let this year for grading and bridges on the Northern-Sagtikos State Parkway loop extending to the Southern at Bay Shore Road. At Bay Shore Road, work will begin on the seven-mile Captree State Parkway, a causeway and bridge system to and across the Great South Bay

New 2½ mile extension of Southern State Parkway, Suffolk County, looking East. Stone-faced bridge carries Deer Park Avenue over the new parkway, with cloverleaf intersection.

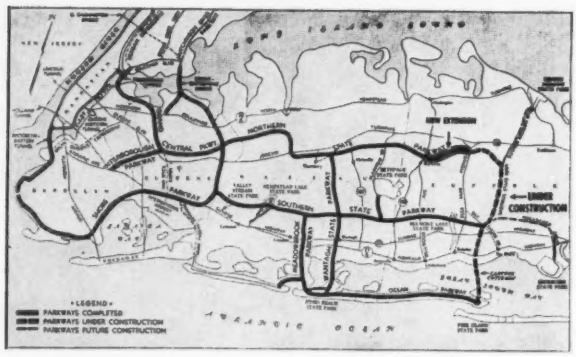
View of Northern State Parkway, Nassau County, Long Island, shows contrasting color of decelerating lanes and of white mountable curbs, typical grade separation structure in background, walks for pedestrians, modern lighting, landscaping, etc.

to the Ocean Parkway at Captree Island at the east end of Jones Beach. When the sixteen-mile loop and causeway are completed two years from now, the Long Island State Parkway system will be 113 miles long and will have 154 bridges. Extensions already designed and to be undertaken in the future will include the 7-mile spur running northeasterly into Sunken Meadow State Park on the Sound where additional land has just been acquired and plans are underway for an expansion of the park, and a 10-mile spur running southeasterly into Heckscher State Park on the Bay where new recreation facilities will also be provided. Completion of the Captree Causeway will bring many additional visitors to Jones Beach State Park where a large building program is now under way including the construction of a new marine stadium at Zachs Bay.

Parkway Design and Engineering

Long experience and practical research have advanced the science of parkway design and engineering as the new extensions are built. The parkways today have twin roadways, each twenty-five feet wide, separated by a grass mall, with acceleration and deceleration lanes of light colored pavement at exits and entrances located so as to permit smooth, uninterrupted movement of through traffic, with attractive bridges eliminating all crossings at grade, with wide grass shoulders for disabled cars, and with mountable white curbs to contrast with pavement darkened by carbon black. Signs are more legible because of large letters reflectorized for night use and designed for easy fast reading to prevent indecision and short stops at exits. Gas stations, appropriately designed, are built along the system at regular intervals. All design improvements aim at comfortable convenient travel at reasonable speeds and full protection is afforded by State law and local zoning against billboards and other undesirable adjacent features.

This year's parkway construction program also includes



the modernization of 14 miles of old dangerous undivided pavements built in the early stages of the program. A center dividing curb[1] to separate opposing traffic movement will be installed together with other up-to-date improvements to make public exits and entrances safer for motorists. With eight miles of undivided pavement previously equipped with a center divider, all of the Northern and Southern State Parkway will be divided highway by the end of this year.

[1]See "Reference Notes," this issue, for additional details.

A State Parkway System

The accident rate on the Long Island parkway system has been steadily going down as the new extensions are built with the latest safety design features and as the old system is modernized. The previous rate of two fatal accidents per 100 million vehicle miles has now dropped to one, as against an overall rate in the nation of about eight. This unusually low rate can be largely attributed to the 40-mile per hour legal operating speed limit on the parkways and is especially significant in view of the large volume of traffic using the parkways. Approximately eleven million cars per year cross each of the two systems at the western end—the Northern State Parkway and the Southern State Parkway—at the City line.

The Long Island State Park System is an integrated part of the comprehensive metropolitan arterial program stemming from the great system of parkways, expressways, thruways and bridges leading in and out of the City of New York—a comprehensive network made possible by the cooperation of federal, state, city, county and other agencies and public authorities which have provided land and funds to carry these projects forward.

New Jersey Turnpike Serves Interstate Traffic

By Henry E. Rose

Director of Public Information, N. J. Turnpike Authority

THE New Jersey Turnpike, now under construction, will contribute importantly to a free-flowing movement of vehicular traffic along the Atlantic seaboard. It will supply the link which has long been needed to facilitate interstate traffic movements to and from the north, south, and west, and it will aid materially in relieving congestion and overloading on the State's public highways.

Traffic congestion on the major New Jersey highways, particularly in the metropolitan areas and on routes carrying week-end and holiday travel, is undoubtedly as great as can be found anywhere in the world. Motorists who have ever visited the New York-New Jersey-Philadelphia areas have been exposed to these conditions. Lines of slow-moving vehicles for miles in length are usual at many places, not only at intervals throughout the day and week, but throughout the year.

The widespread existence of these traffic "bottlenecks" has been impossible of elimination in any feasible manner under the normal State Highway program for the State of New Jersey. Authorities agree that the building of this express traffic artery under the present State Highway program, and with usual State Highway funds, would be impossible of practical accomplishment. The building of the Turnpike with private capital and with the user paying for its construction and maintenance, on the other hand, will permit the normal State Highway program to be much more effective in caring for the needs of the State.

This new superhighway will be 118 miles in length. It will be a modern all-weather toll road and it will incorporate every advanced technique of the highway engineering profession. It will extend from a point near the George Washington Bridge, in the north, to Deepwater, N. J., in the south, where it will connect directly with the Delaware Memorial Bridge, now under construction.

An Important Link in the National Network

Highway movements of great magnitude are established facts between the cities along the eastern seaboard, and from the eastern states to the mid-west. Relatively free traffic movements are now possible from the New York City area northward up the Hudson River Valley and eastward through U. S. Route No. 1, across Connecticut by Merritt Parkway and Wilbur Cross Parkway, through Massachusetts by existing highways or those in the process of extension, along the New Hampshire Turnpike now completed, and along the Maine Turnpike as far as Portland.

To the southward from the Delaware Memorial Bridge, which will be the southern terminus of the New Jersey Turnpike, are the Du Pont Boulevard through Delaware, U. S. Route No. 40 to Baltimore and thence to Washington, Richmond and points south.

The journey by motor vehicle across New Jersey, meanwhile, has been long known to be difficult, hazardous and slow. The Turnpike's completion will contribute in a remarkable way to correct this condition.

It is inevitable that, in a few years, the New Jersey Turnpike will connect directly with the Pennsylvania Turnpike at a point north of Philadelphia. With the easterly and westerly extensions of the existing Pennsylvania Turnpike completed, and a further connection with the proposed Ohio

Turnpike south of Cleveland, legislation for which has been enacted, the movement of highway traffic to and from the middle west will be greatly expedited.

Interchanges Strategically Located

The Turnpike's sixteen traffic interchanges will be factors in the attainment of this free-moving traffic. The Swedesboro-Chester Interchange, near Swedesboro, as an example, will serve traffic to and from the Chester Ferry across the Delaware River. The Woodbury-Camden Interchange, in South Camden, will provide access between the south and the Philadelphia-Camden area and between New York and north Jersey areas.

The Camden-Philadelphia Interchange, in North Camden, will provide essential access to the Philadelphia-Camden area, including the Tacony-Palmyra Bridge over the Delaware River from the northward. The Burlington-Mount Holly Interchange, near Mount Holly, will provide access to and from the Burlington-Bristol Bridge over the Delaware River. The Bordentown-Trenton Interchange, near Bordentown, will provide access to the Trenton area from the southward and, of significant importance, will serve as a logical junction point with the extended Pennsylvania Turnpike in the future.

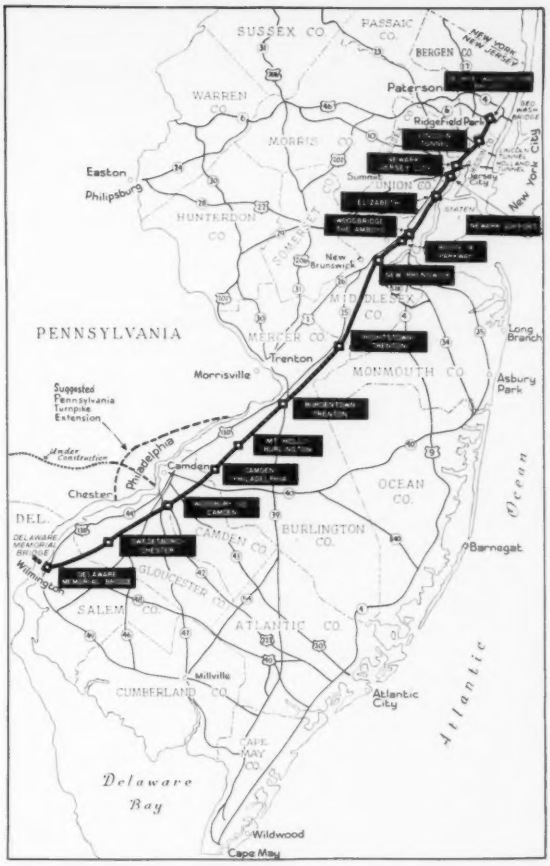
All interchanges from New Brunswick to the southward, in fact, and also the southern terminus of the Turnpike, at Deepwater, will provide means for access to and from the rich agricultural lands of central and southern New Jersey, offering the products of these areas direct and quick movement into the metropolitan area of New York. In addition, the movement of traffic between the New Jersey beach resorts and the densely populated areas of northern New Jersey and New York will be greatly facilitated by these interchanges during heavy holiday movements.

The Elizabeth Interchange, in Elizabeth, will provide access to the important industrial area and communities adjacent to Elizabeth, and, in addition, will provide access to and from the Goethals Bridge to Staten Island.

The Newark Airport Interchange, near Port Street in Newark, will serve as a most important collecting and distributing point for traffic to and from N. J. Route 29 toward western New Jersey and Pennsylvania, the Newark Airport and the Port of New York Authority's Newark truck terminal, to be opened this summer. This interchange should be a major factor in the heavy movement of passenger vehicles to and from the Pulaski Skyway and the Holland Tunnel by way of the Route No. 25 viaduct north of Newark Airport. The Newark-Jersey City Interchange, at Raymond Boulevard, in Newark, will provide access to and from the Newark business and industrial districts, the Jersey City-Bayonne area, and the Holland Tunnel.

The Lincoln Tunnel Interchange, in Secaucus, will provide direct access to the Lincoln Tunnel to New York on the east, and to points along Route 3 and S-3 to the west and south. Important truck terminals are located at Secaucus where this interchange will be established. South of the Lincoln Tunnel Interchange, and north of the Newark-Jersey City Interchange, at Raymond Boulevard, in Newark, are to be high level Passaic River and Hackensack River Bridges, the most important structures along the route of the Turnpike. Between these bridges will be an excellent location for an interchange to connect in the future with any new tunnel which may be built under the Hudson River to midtown Manhattan.

The northern terminus of the Turnpike at Route 6 in



Ridgefield Park will provide access to and from the George Washington Bridge over the Hudson River to the eastward and northward and westward to the rapidly growing Bergen County area.

Clearly, the New Jersey Turnpike will have a tremendous effect on highway travel within and through the State of New Jersey, especially on truck movements. Likewise, the Turnpike will have a profound effect upon the design, location and construction of new highways both within, and adjacent to, the State.

The Turnpike's completion is scheduled for late 1951.

Envoi

"The motor, which the frenzied cupidity of manufacturers hurls like a Juggernaut's car upon the bewildered people and of which the idle and fashionable make a foolish, though fatal, elegance, will soon begin to perform its true function, and putting its strength at the service of the entire people, will behave like a docile, toiling monster. But in order that the motor may cease to be injurious and become beneficient, we must build roads suited to its speed, roads which it cannot tear up with its ferocious tyres, and from which it will send no clouds of poisonous dust into human lungs. We ought not to allow slower vehicles or mere animals to go upon these roads, and we should establish garages upon them and footbridges over them, and so create order and harmony among the means of communication of the future. This is the wish of every good citizen."

Penguin Island, Anatole, France, 1907

Polarized Light for Auto Headlights

By E. H. Land and L. W. Chubb Jr.

Polaroid Corporation, Cambridge, Massachusetts

This is the second of two articles on this subject. The first[1] dealt with those fundamentals of polarization which are of particular importance in the headlighting application. The present article gives information on equipment, use and performance of the polarized system.

Part II

BEFORE discussing how a polarized headlighting system may be used effectively, one should have a clear understanding of the short-comings of the present system of automotive headlighting and of what promise exists for overcoming these limitations by ordinary means.

Modern headlight installations, employing the Sealed Beam lamp, are highly standarized and their operation is reasonably uniformly specified throughout this country, although the enforcement of correct practice is lacking in many states. This refers principally to misuse of the headlights in situations where cars are meeting and passing on country highways. Misuse may result from lack of knowledge of correct practice or from unwillingness on the part of a driver to respect the comfort of drivers he is meeting. Whichever the cause, both comfort and safety are compromised by misuse, and everyone who drives at night recognizes that enforcement of proper practice in headlight use is among the factors which might reduce the alarmingly high toll of night accidents which, moreover, is taken during hours when people are disinclined to drive largely on account of the discomfort and hazard due to headlight misuse.

Modern headlighting operates on the principle of beam control. Each driver has the use of two separate headlight beams emitted by a single pair of lamps, through the operation of a footswitch. The upper, or country driving beam, produced by a 45 watt filament in each lamp, is for use outside of city limits when no approaching traffic is being met. Proper headlight aiming specifies that the high intensity portion of this beam shall be directed downward from horizontal by 3 inches at a distance of 25 feet. This amounts to approximately 0.6°. Under good conditions, on a straight road, this beam will disclose objects as far ahead as 500 feet, a distance which is ample for stopping the modern car from any reasonable speed. The lower, or traffic beam, produced by a 35 watt filament in each lamp, is for all use within city limits and for all occasions on the country highways where opposing traffic is being met. Through precision location of the lower beam filament above and to the left of the focus of the headlight's parabolic reflector, the high intensity zones of the lower-beam pattern are directed downward and to the right side to provide foreground illumination and shoulder lighting. This action is assisted by the prismatic structure of the headlight lens, which also serves to spread and diffuse the light to give even illumination from either upper or lower beam. Manufacturing tolerances in Sealed Beam lamp production are such that the lower beam can be considered properly aimed if care is exercised in properly aiming the upper beam. With frequent aiming of headlights already required because of mechanical vibrations, shocks, collisions, etc., little in the way of better all-around aiming could be gained by separating the upper and lower filaments into two separate pairs of lamps. However, this does not apply to the quality of the beam patterns. Considerable improvement in both beams might be achieved through the use of four lamps as was urged by the lamp manufacturers at the inception of the Sealed Beam program. At present, a single lens is being required to do two patterning jobs. The compromise tends to favor one beam and discriminate against the other.

In addition to the physical design limitations suggested by the foregoing, specifications also exist on the brightness of the light which today's headlights may emit. Thus the Uniform Vehicle Code specifies that a pair of headlamps shall deliver no more than a total of 75,000 candlepower (cp) at the point of maximum intensity in the upper beam pattern. Also, not more than 8000 cp shall be directed above horizontal by the upper beam. The Code specifies lower beam distribution by requiring that *none* of the high-intensity portion be directed above a certain level; actually this works out to between 800 and 1,000 cp in the eyes of an approaching driver on a level road.

One might well wonder why a branch of the Federal Government has seen fit to impose such specifications on the lamp manufacturer until one realizes that these restrictions in the Uniform Vehicle Code are for the comfort and safety of *the "other" driver against whom* such headlights employing beam control can be and frequently are misused. By law, every driver is required to use his lower beam when approaching on-coming traffic within 500 feet. Under ideal conditions (proper aim, level road, etc.) this action will divert the high intensity portion of the beam pattern from the approaching driver's eyes. For very slight variations in vertical road contour, an angular margin is provided to avoid temporary glaring. But even a pitch of two or three degrees is sufficient to cause the high intensity portion of the lower beam to project above horizontal and produce up to 20,000 cp glare. This condition is worse when headlights are misused, for only a 1° angular elevation can direct twice that amount of light into an opposing driver's eyes from the upper beam. Thus the 800-1000 cp tolerable glare, which alone is often enough to reduce perception distance by 30 per cent, is frequently exceeded due to road contour.

The most important shortcoming of the beam control principle is related to glare, however, only in a secondary sense. The need for avoiding blinding glare makes it necessary for drivers to depress their beams when meeting. But neither driver can offer this relief from glare without penalty to himself because in redirecting the light by which he sees to an area close at hand, he leaves in nearly complete dark-

[1] *Traffic Engineering;* April, 1950, Page 265.

ness that portion of his right of way extending beside and beyond the opposing car. At such times, unless the drivers slow down to less than 40 mph they will be overdriving the perception distance and creating a hazard. It is well known that this precaution is seldom observed and that, beyond showing a slight increase in attentiveness, a driver only feels his way through these meeting situations by watching the edge of the road and the position of the opposing car (both subject to abrupt change), and by remembering what he saw of the roadway before he depressed his beam. Thus we see that the beam control principle of modern headlighting merely affects a compromise by balancing barely tolerable glare against barely adequate seeing. It divides the hazard of blinding glare into these two other hazards. Beam control alone does not promise further improvement under conditions where each driver *needs* to put a powerful beam right where it will blind another. A system is required which will enable every driver to maintain use of his upper beam uninterruptedly and *particularly* when other cars are being met. Polarization makes possible such a system. Perhaps the simplest way to sum up its performance is this: With properly installed screens over the headlights and with similarly oriented viewers before the drivers' eyes, conditions can be such that any driver always drives with illumination at least comparable to that from today's upper beam and *as though* every approaching driver were getting along with a beam several times dimmer than today's lower beam.

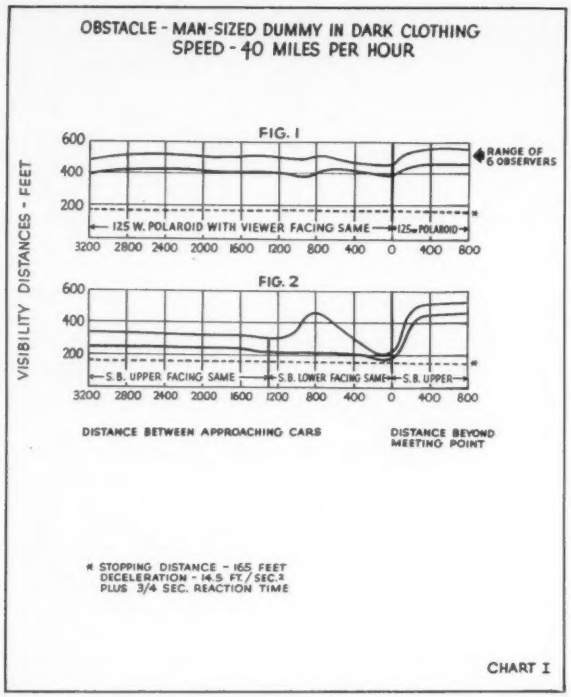
In Part I of this discussion we noted that polarizers have an inherent absorption for natural light, amounting to at least 50 per cent. It is this fact which makes the use of a polarized headlight system not merely a case of placing screens over conventional headlamps. The light absorbed in the screens must be made up for by greater output at the lamp filaments, and since absorption runs about 60 per cent, this means $\frac{1}{1. - .6} = 2.5$ times the present filament output, bringing the required wattage per lamp to $2.5 \times 45 = 112.5$ watts. Then, because there is a further slight absorption by the viewer due to depolarization of the beam as it is reflected back from diffusely-reflecting surfaces on the roadway, still a few more watts are needed if open road visibility with the polarized beam *and the viewer in use* is to equal the open road visibility afforded by Sealed Beam upper beam. A wattage of 125 per lamp is sufficient to provide this condition. This means $\frac{125}{45} = 2.8$ times the present wattage.

One might expect that with our present knowledge of electric power generation, provision for tripling the current requirements for a car's headlights might be made with a minimum concern—particularly in a machine where several horsepower are wasted in the radiator alone. Actually, tripling the headlight wattage requires only a doubling of the generator capacity and no change in battery. Yet, as we shall see, the need for providing this heavier generator, and the cost incident thereto, is one of the chief reasons why polarized headlighting is not on our new cars today. Generator capacities have been increased step by step over the past 20 years to care for added electrical demand but, inexplicably, the thought of doubling the capacity in one step appears too much of a mental hurdle for the car manufacturer. If agreement could be reached on building the necessary equipment into all new cars, the increase in *selling price* would probably be around $25 per car for the complete system. It must be admitted that some manufacturers have given higher estimates than this, but in no case did the cost to the buyer exceed that of a good car radio.

If the polarized system were built into all new cars, how would it be used during the transition period when unequipped ("old") cars continue to operate on the highway? The use of a separate pair of "traffic" lamps as a component of the system solves the problem of mixed driving. These lamps are of fog-light size, 60 watts rating, and produce a beam essentialy like the Sealed Beam lower beam for one of the two alternate positions of the footswitch, the other position activating the 125 watt polarized units. Thus, beam control is preserved during the introductory period but by separating the beams between two pairs of lamps each can be made a better beam, patternwise, and the losses inherent in polarizing a beam for use within city limits are not incurred.

The driver of the new car carrying polarization observes a single, simple rule of the road: DIM FOR WHITE LIGHT. Use of this rule is made possible by arranging for the extinction color of on-coming polarized lights to appear a deep blue, a matter of choice of proper polarizer characteristics in the headlamp and viewer screens. Thus, if, through his viewer, the driver sees all blue headlights approaching, he continues on his upper beams, whereas if any approaching light appears white, he kicks his footswitch, as today, and the passing is effected as though neither car had polarization. In every case where the user of the new system meets an unequipped car, relatively frequent for the first few months or year, he must revert to beam control and put up with meeting situations like today's, but whenever he meets cars similarly equipped he will enjoy the privilege of continuing with his upper beam on, with visibility by and beyond the approaching car preserved at a level about equal to that experienced when there is no opposing car. Surveys indicate that the incidence of all-polarized meetings will increase very rapidly and indeed will be higher at the beginning of the interim period than any ratio of total new car to total old car registration would indicate, because cars driven at night on country highways tend to be the newer cars by a higher ratio.

No discussion of polarized headlighting would be complete without an acknowledgement of the part which the automobile industry and the General Electric Company have played in conducting a study of its possibilities, extending over a period of years ending in November, 1947. The Automobile Manufacturers Association (AMA) undertook this study at the request of the American Association of Motor Vehicle Administrators (AAMVA). The AMA evolved specifications for the technically adequate installation now ready for adoption and arranged for a series of mass demonstrations in which more than 40 fully equipped cars were used on numerous occasions. General Electric Company solved the problems of lamp design and Polarized Corporation those of polarizer development and application. Each of the three groups made considerable contributions in the way of money, man-hours and equipment. At the conclusion of the study, the AMA recommended to the AAMVA "against adoption at this time." A number of reasons were given for this recommendation. It is safe to say that every one of these reasons stemmed from the basic fact that the AMA saw no practical way of adopting the system without prescribing a period of mixed use of cars carrying present headlighting equipment and cars carrying polarized equipment, during which owners of the new equipment would


OBSTACLE - MAN-SIZED DUMMY IN DARK CLOTHING
SPEED - 40 MILES PER HOUR
FIG. 1
VISIBILITY DISTANCES - FEET
600
400
200
RANGE OF 6 OBSERVERS
125 W. POLAROID WITH VIEWER FACING SAME
125 POLAROID
3200 2800 2400 2000 1600 1200 800 400 0 400 800
FIG. 2
S.B. UPPER FACING SAME
S.B. LOWER FACING SAME
S.B. UPPER
DISTANCE BETWEEN APPROACHING CARS
DISTANCE BEYOND MEETING POINT
* STOPPING DISTANCE - 165 FEET
DECELERATION - 14.5 FT./SEC.²
PLUS 3/4 SEC. REACTION TIME
CHART I

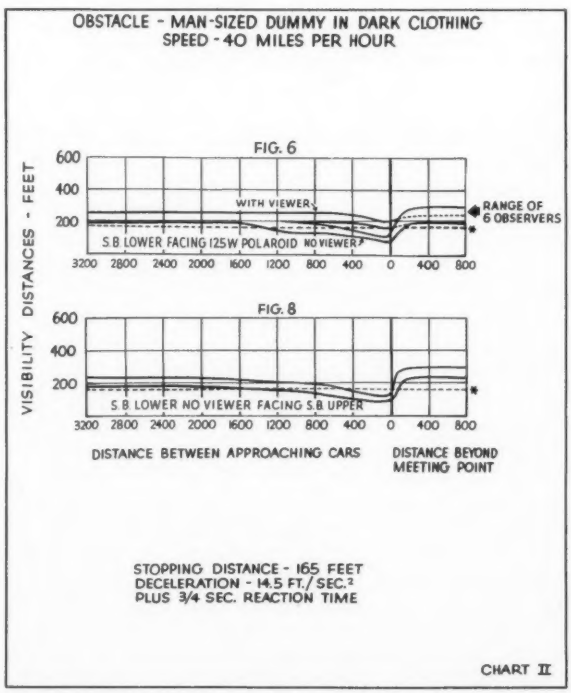
Driver-visibility distances—proper headlamp usage.

not obtain its maximum usefulness and during which new driving conditions[2] might develop which might lead to confusion or even hazard. No disagreement existed as to the obvious benefits of the system; the following are direct quotations from the AMA report:

"All cars can have identical polarized lamps and viewers, and have the viewers on any car prevent glare from any opposing car's polarized lamps. With his viewer in use any driver can see the illumination from his own headlamps practically without interference from opposing polarized headlamps. When the opposing car is close, he can see the roadway beyond the opposing car's polarized headlamps." . . . "Road vision during the operation of meeting is much better than obtainable with Sealed Beam." . . . "When using the polarized lamps without a viewer on the open road, the driver has a more satisfactory beam than Sealed Beam upper."

If further support for the system were required, there exists a vast amount of data compiled by General Electric Company on an appraisal of the polarizing system on the basis of quantitative measurements which showed the comparative visibility distances obtainable with the proposed system as against the present Sealed Beam system for a great number of different combinations of headlighting when cars are meeting. We are indebted to Mr. Val J. Roper of General Electric for the use of Charts I and II. Chart I compares maintenance of visibility distance for a driver using polarization (Fig. 1) with that for a driver using present equipment (Fig. 2), each meeting a like-equipped car and assuming proper headlight usage. Note that in Fig. 1 the six observers all maintained a visibility distance of about 400 feet from the time the two cars were 3200 feet apart until after they had passed. On the other hand, today's headlighting properly used, as shown in Fig. 2, gave wide variation in visibility distance as a function of the relationship of the meeting cars and considerable spread between observers as the cars approached close. The peak in the upper curve in this figure is due to the unreliable phenomenon of silhouette seeing, which all observers do not experience. Finally, notice the margin of safety provided by the polarizing system (Fig. 1) by maintaining visibility distance well in excess of the safe stopping distance denoted by the dotted line at 165 feet. This margin is not maintained with Sealed Beam lighting (Fig. 2) and, in fact, decreases to a margin of only a few feet, even at the fairly reasonable speed of 40 mph. These data are for persons knowingly engaged in tests and expecting to see the test obstacle. When an observer consciousness factor is introduced, the comparison becomes even more significant, for today's headlighting is then shown to be unsafe for the operation of meeting these cars at speeds of 40 mph.

Figures 6 and 8 of Chart II are important because they go far toward disproving the objection voiced by some persons that the brighter, horizontally-aimed polarized beam will, when misused, give rise to increased hazard during the interim period when mixed meetings occur. Figure 6 shows that an "old" car operator using his lower beam (and with no polarized viewer) drives for a distance of 725 feet (or for 12 secs.) with required stopping distance in excess of visibility distance (lowest curve) when confronted with the glare from 125 watt polarized lamps. But Fig. 8 shows the same driver to be operating similarly "blind" for the same period (lower curve) when confronted with the glare from today's Sealed Beam upper beam! Obviously, above some


OBSTACLE - MAN-SIZED DUMMY IN DARK CLOTHING
SPEED - 40 MILES PER HOUR
FIG. 6
VISIBILITY DISTANCES - FEET
600
400
200
WITH VIEWER
RANGE OF 6 OBSERVERS
S.B. LOWER FACING 125 W POLAROID NO VIEWER
3200 2800 2400 2000 1600 1200 800 400 0 400 800
FIG. 8
S.B. LOWER NO VIEWER FACING S.B. UPPER
DISTANCE BETWEEN APPROACHING CARS
DISTANCE BEYOND MEETING POINT
STOPPING DISTANCE - 165 FEET
DECELERATION - 14.5 FT./SEC.²
PLUS 3/4 SEC. REACTION TIME
CHART II

Visibility distances for a sealed beam driver—improper usage.

[2] *Traffic Engineering;* March, 1949, Page 267.

(*See* POLARIZED LIGHT, *page 399*)

Downtown Parking vs. Public Transit

By R. Gilman Smith
W. C. Gilman & Company, Engineers, New York City

The Basic Problem

THE citizens of our urban centers are confronted daily with aggravating conditions of which the following are typical examples:

Private automobile travel on many important streets is slowed to three or four miles an hour by traffic congestion.
Off-street parking space is expensive and difficult to find in convenient locations.
Curb parking space—metered or unmetered—is not available except several blocks from desired destination.
Commercial vehicles are parked in traffic lanes.
Transit service on certain lines is infrequent and travel is slow on many streets because of other vehicular traffic.
The transit fare is 10c, or possibly 12c, 13c or 15c.
Some of the transit vehicles are old and not as pleasant to ride in as those which are new.

These difficulties which beset the travelling public have been the subject of much study. Large sums of public money have been spent and are being spent currently for the widening of existing streets, the building of new highways, the installation and operation of traffic lights and the development of additional off-street parking facilities. Transit systems have cooperated by modernizing their equipment to the extent that funds have been available.

What are the results?

Initially each new or improved facility produces some relief. One-way streets eliminate delays due to left hand turns. Curb set-backs provide additional traffic lanes. Express highways make vehicular access easier from outlying areas. New garages or parking lots increase the off-street facilities for the storage of automobiles. The relief provided by these costly improvements, however, is not permanent. The added facilities and the temporary easing of certain acute situations immediately entice more people to use their private automobiles instead of public transit (and therefore requiring from 12 to 15 times as much street space), and the general problem promptly becomes more aggravated than ever. The reservoir of potential automobile commuters is so huge that the results achieved are about as satisfying as an attempt to drain the ocean by digging holes in the sandy beach. The irritations and excessive costs resulting from the snail-like movement of automobiles and commercial and transit vehicles continue unabated and perpetuate the present forced trend toward decentralization.

The Basic Causes

The primary cause of this near and sometimes complete stagnation of traffic flow is the attempted movement of too many vehicles over inadequate street space. The solution, obviously, is a program which will bring about such a relationship between the reasonably available street space and the number of vehicles using it so that traffic can proceed normally.

Such a practical relationship will never be achieved by continuing to pursue the philosophies now being generally practiced.

In the first place many of our cities have developed extensive systems of parking or express highways. These existing systems are being improved and extended. Other cities have similar projects in the planning stage. Typical examples are:

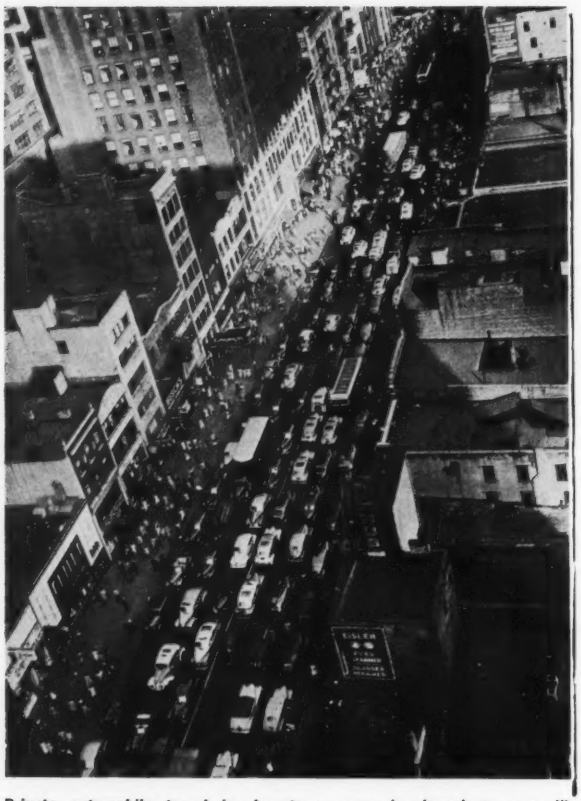
The extensive expressway and parkway system in and radiating from New York City including the East Side and West Side Express Highways.
The North and South Lake Shore Drives in Chicago and the projected Northwest and Congress Street Superhighways.
The Penn-Lincoln Parkway and proposed Point Park development in Pittsburgh.
The East and West Lake Shore Drives in Cleveland.
The extensive parkways completed and under construction in and around Los Angeles.

These highways are wonderful, and they should be as they represent the expenditures of stupendous sums of money. They make it easy for the people of these cities to drive into the country on summer evenings and on week ends. They make it equally easy for people in the outlying sections of these cities and the suburbs to commute by automobile. At least this commuting is easy until the business sections of the city are reached. It is then necessary for these increasing numbers of automobile commuters to disgorge themselves onto the already congested street networks of Brooklyn or Manhattan, the Chicago "Loop", Pittsburgh's "Golden Triangle" or similar areas in other cities.

They then proceed at a snail's pace fighting and impeding the movement of commercial traffic, transit vehicles and pedestrians and resent the delays imposed by the traffic lights. Finally they come to rest in off-street parking lots or multi-story garages or at curb locations where on-street parking is permitted or condoned.

In these central business districts, and in many outlying business centers in these metropolitan areas, the land values and the property improvements are such that the development of additional street space is an economic and physical impossibility. The business and commercial enterprises located in these areas will have to continue to rely on the existing street patterns for the flow of their life blood of operating supplies and merchandise and, except where underground or overhead transit facilities are available, for the equally important daily flow of customers and employees.

Is it not of the utmost importance, therefore, that these existing street patterns be used as efficiently as possible? This efficient use of street space means first that the largest possible percentage of street area be used for vehicles in motion, and second that the necessary movements of both goods and persons be carried on with vehicles which are the least wasteful of street space. The continued construction of extensive additional off-street parking facilities within these congested areas defeats rather than promotes the realization of this second and most important objective. Streets in these areas are now overloaded. Additional parking facilities entice more commuters to use their automo-



Private automobile travel in downtown areas is slowed to a snail's pace by traffic congestion. *Photo by ACME*

biles instead of public transit and thereby increase many fold the number of vehicles which must use these overloaded streets, since they are the only means of reaching and departing from these facilities. Most of this increasing use consists of all day parkers who attempt to arrive simultaneously in the morning and depart in an equally short period in the late afternoon. In addition to overloading the restricted street areas these vehicles impede the normal flow of traffic by their turning movements into and out of the parking facilities. It is these concentrated movements which cause the periods of worst traffic congestion in most of our cities.

Indicated Steps Toward Solution

The answers seem equally as obvious as the causes.

Where physical and economic conditions are such that more ample street space cannot be provided, the balance between the available traffic lanes and the volume of traffic to be cared for must be secured by controlling the number of vehicles. Commercial traffic can be regulated to a considerable extent by hours of the day, but cannot be prohibited as there are no alternative means of handling goods and services. Persons making use of these congested streets to reach parking facilities for private automobiles can be transported within those areas by transit vehicles. The resulting increase in the efficiency of the use of street space would be tremendous.

Specifically this reversal of present trends would involve the following steps:

(a) The development of extensive off-street parking facilities in areas adjacent to but outside of congested areas, and immediately adjacent to and easily accessible from all expressways or other main travel arteries leading into these business areas. Such parking facilities would then be located where property values are lower, and a large capacity could be secured without the necessity of such expensive structures as are required in areas where land values are higher. This should mean lower fees for all day parking.

(b) The establishment of frequent and adequate transit service between these outlying parking facilities and the business areas.

(c) An essential corollary is the more extensive prohibition of on-street parking, the prohibition of double parking, further restrictions of turning movements and the adoption and enforcement of other necessary regulations so that there may be the maximum possible number of lanes of free moving traffic, particularly in rush hours. Coupled with these on-street regulations should be a gradual curtailment of off-street parking facilities until they are reduced to the number necessary only to meet normal short term parking requirements, and their rates adjusted to discourage all day parking. Initially the overall advantages of this general program will not be appreciated, and these corollary restrictions will be required to effect the necessary change in the established habits of the automobile commuter.

Summary of Overall Advantages

The more important advantages which will result from such a program will be as follows:

To the Automobile Commuter:

Present automobile commuters will reach their destinations more promptly because the reduced traffic congestion will permit the transit vehicles to make better time than can be made by the automobiles.

The outlying locations of the parking facilities will permit fees which when added to transit fares will result in daily costs which are less than fees now charged the business areas.

More people can commute by automobile because more parking facilities can be made available.

To the Shopper or Short Term Parker:

The reservation for short term parkers of the parking facilities in the congested areas will provide more of such facilities for the shopper who does not relish riding a transit vehicle when laden down with bundles.

To the Commercial Enterprises in the Congested Areas:

Both customers and employees will be able to travel more

On-street parking prohibition and one-way regulation will provide the maximum number of lanes of free-moving traffic.

rapidly and more comfortably.

The delivery of goods and supplies will not be subjected to the present irritating and expensive delays.

To the Cities and Their Taxpayers:

Substantial future expenditures for street improvements will be avoided.

Current costs for traffic regulation and control will be reduced.

Movements of fire apparatus and other emergency vehicles will be expedited.

With the freer movement of both persons and goods the decentralization trend should be lessened.

To the Transit System:

The freer movement of all traffic will result in more rapid and more regular transit service with fewer delays. This will make the service more attractive and will reduce operating costs.

The transit traffic to the outlying parking facilities will be new business and will be short haul riding which should be profitable even though largely on peak.

To the extent that the increased parking facilities induce more automobile commuters, present long haul transit passengers will be converted into short haul riders.

To the Parking Facility Operator:

The reservation of congested area parking facilities for short term parkers will increase the daily turnover.

The location of the outlying facilities adjacent to expressways or main highways will make it certain that there will continue to be large volumes of traffic available, as these are not likely to be relocated. Since they will be connected with the business centers by transit lines, they will not be affected by changes in the development of those areas as the bus routes are flexible and can even be adjusted to meet the changed requirements during different periods of the day.

Conclusions

The realization of these benefits will take time. Not only must physical facilities be constructed but the habits of a large number of people must be changed.

The general public will have to be educated to the principle that the ownership of an automobile does not necessarily give them the right to the unrestricted driving of that automobile on any and all streets at any and all times. This sounds like an impossible curtailment of private rights. It is, however, only an extension of restrictions now being enforced, and an extension made necessary to secure the maximum benefit for the greatest number.

We now have streets on which traffic is restricted to one direction only. We have highways from which trucks and commercial vehicles are excluded. In certain cities we have play streets from which through traffic is excluded. All cities have certain restrictions as to on-street parking. In many locations vehicle turning movements are restricted or prohibited and certain cities have street areas where no stopping of vehicles is permitted.

The curtailment or regulation of individual freedom of action has become necessary in many other instances. Pedestrians must obey the traffic signals in many cities. Smoking is prohibited in many public places and in Chicago is now prohibited in all passenger elevators. It is against the law to own or carry certain types of firearms unless licensed to do so. Zoning regulations restrict the uses which can be made of private property, and in certain cases limit the size of buildings which can be constructed. Our advancing civilization has made these and many other restrictions and prohibitions necessary to protect public life and health and to preserve property values.

In many cities outlying—or "fringe"—parking facilities have been developed. Some are still in operation and some have been abandoned. In general they have not been too successful as business ventures. This has been due to the fact that their development has not been accompanied by a corresponding curtailment of existing on-street or off-street parking facilities in the congested areas. For this same reason their development has resulted in no relief of traffic congestion.

The effort has been and still is to provide more and more parking facilities, irrespective of location and irrespective of the capacities of adjacent streets. This is the concept which must be changed. Existing street capacities in business areas should be the starting point for planning the development and rearrangement of parking facilities and revisions of traffic movement controls so that vehicular traffic in those areas will be made up essentially of those types of vehicles which make the most efficient use of the limited street space.

Federal Funds For Safety

A proposed Federal-Aid Highway Act of 1950, reported out recently by the House Committee on Public Roads, includes a section which would authorize and direct the Commissioner of Public Roads, Thomas H. MacDonald, to "assist in carrying out the Action Program of the President's Highway Safety Conference and to cooperate with the State highway departments and other agencies in this program to advance the cause of safety on the streets and highways." The bill would authorize up to $75,000 annually for this purpose.

The President's Conference has been staffed by personnel from the Bureau of Public Roads. Mr. MacDonald has been serving the Conference as Chairman of the Coordinating Committee and Committee on Conference Reports.

STEEL STRAPPING

FOR STREET SIGNS

Send for information pertaining to our Introductory Offer—Material to attach 50 signs—including tools, dispensing reel, strapping, brackets, and bolts.

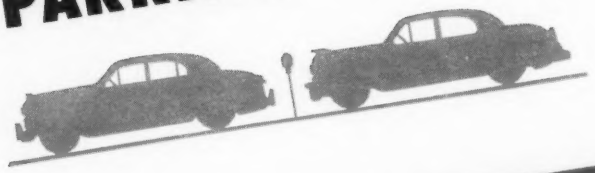
Erection crews like the greater convenience of this A. J. Gerrard method and budget wise departments like the economy it brings.

SS-4

A. J. Gerrard & Co.

1954 HAWTHORNE DRIVE • MELROSE PARK, ILL.
(Chicago Suburb)

Presenting the new KARPARK TWIN-O-MATIC PARKING METER



Brilliantly designed . . . starring every feature wanted in a parking meter . . . The KARPARK Twin-O-Matic scores a BIG HIT with everyone . . . mayors, treasurers, safety directors, police officers, and the parking public.

THE STURDY KARPARK "HUSKY"

THE STEEL HEAD KARPARK "SUPERIOR"

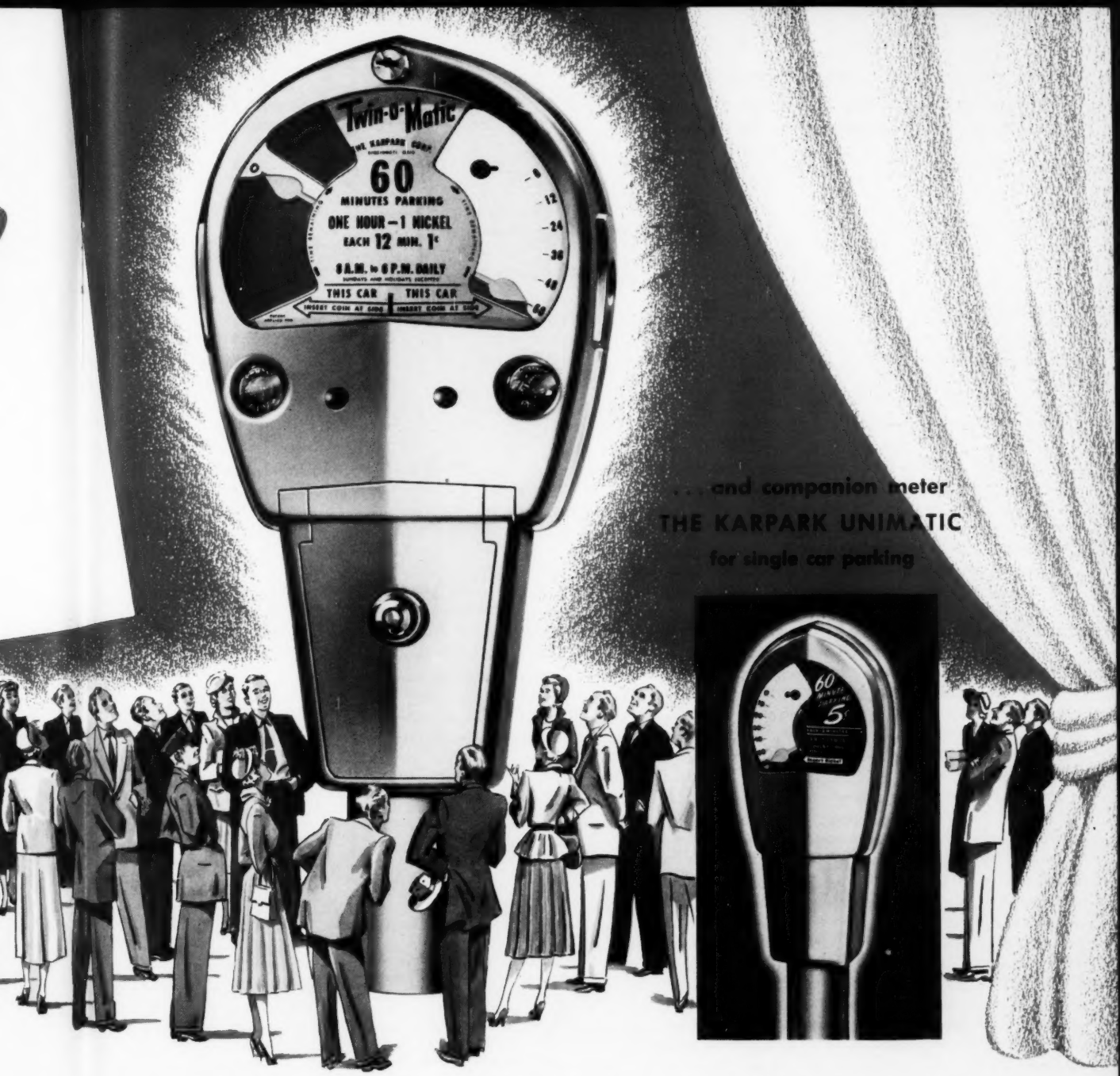
JOINING THE "FIRST FAMILY" OF PARKING METERS
The Twin-O-Matic is a new addition to the famous KARPARK line. With its "extra" features it rounds out and completes the greatest selection of meters available—every model noted for accuracy, sturdiness, and trouble-free performance.

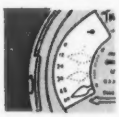
Here's a brief listing of
IMPORTANT POINTS:

TWO METERS IN ONE HOUSING: Each Twin-O-Matic times two cars and cuts in half the number of installations needed. Initial cost is reduced to the minimum; servicing and collection are speeded with maintenance expenses kept low; neat appearing streets are assured.

INTERCHANGEABLE METERS: Each complete, independently operating mechanism can be readily shifted from twin to single; from one housing to another. Extreme flexibility in use makes it easy to take care of any desired change in parking practice.

EASY TIME OR COIN CONVERSION: Changes in parking control and regulations are instantly made . . . on the street or parking lot . . . in a matter of minutes. Easy adjustment to any parking condition increases scope and multiplies use of meters.





CHOICE OF FULLY ACCUMULATIVE OR NON-ACCUMULATIVE TIME: Makes it possible to meet any parking requirement, in any locality. This "extra" adaptability permits greater freedom, greater efficiency, more specific application in traffic planning.

AUTOMATIC OPERATION: The easy, simple insertion of a coin is all that's required of the parker. Trouble-free enforcement, greater use, greater efficiency, and improved traffic control are automatic results.

MADE BY THE HERSCHEDE HALL CLOCK COMPANY: Parking meters are timing devices. Quality of workmanship and assurance of dependable performance are guaranteed by the outstanding reputation of Herschede —makers of the finest clocks in America for over three generations.

COMPACT, MODERN DESIGN: Carefully planned to utilize every inch of space, the modern, stream-lined appearance of this KARPARK triumph reflects a progressive, well managed city. The single meter—used at street ends and special single locations—blends in design with the Twin-O-Matic meter and maintains, everywhere, a uniform attractive effect.

LOW IN COST: Though the line-up of its features is imposing, the price of this new meter is surprisingly low. Every responsible city official will want to investigate the economies offered.

WRITE FOR FULL INFORMATION: To know more about the details and the many commanding advantages of this new KARPARK creation, write today.

THE KARPARK CORPORATION
CINCINNATI 6, OHIO

Open Discussion

By H. W. Perry
41 South Clinton Street
East Orange, N. J.

Greater Street Capacity

THE basic cause of traffic congestion in our major cities has been the multiplication of business and residential floor area by erection of higher and higher buildings during the last half century, whereas there has been no increase of street area in the business centers. Therefore the various traffic-relief measures adopted to date and others proposed do not offer a long-time solution of the problem.

Street area usable by vehicles could be increased 25 per cent or more and rate of traffic movement probably doubled by removing present sidewalks, paving the streets from building line to building line, and constructing new sidewalks at the average level of the second floors of abutting buildings.

Assume, for example, a street 60 feet wide from building line to building line, now with a 10-foot sidewalk on either side. These reduce the width for vehicles to 40 feet, and trucks or other vehicles standing at the curb restrict it further to about 30 feet on a one-way street or not much more than 20 feet on a two-way street. In either case, only two lanes are open for safe free flow of traffic. Elevation of the sidewalks to a height of, say, 15 feet would provide two more 10-foot lanes, which would permit fast vehicles to overtake and pass slow vehicles and buses stopped for passengers.

Not only would traffic flow be greatly expedited, but complete separation of vehicular and pedestrian traffic would virtually eliminate pedestrian fatalities and injuries caused by vehicles in the area where the walks were raised.

Such elevated walks could be of light-weight construction supported on brackets attached to walls of frames of adjacent buildings or to supporting pillars placed on city property as close as possible to building lines. Floor of the walks would be set with glass to admit light to the street below, and luminnaires would be mounted on standards at the outer railing of the walks, where they would be readily accessible for maintenance by workmen on foot. Inner side of the walks would be open directly into second floors of buildings.

Such walks could be carried across street intersections on truss girders or by suspension cables, and at the corners provision should be made within buildings for passengers waiting for buses. Present lamp posts would be removed, refuse baskets placed on the raised walks, and letter boxes and fire and police call boxes be affixed to buildings or close to them at the inside of the walks at street intersections, perhaps with extensions to the street level.

Thus, with the street entirely free of sidewalks and obstructions, trucks and delivery vehicles would load and unload directly into the buildings instead of across sidewalks as now, and persons arriving by taxicab or automobile would step directly into the existing street-level entrances. The elevated walks would protect truckmen and passengers from rain while passing to and from stores and office buildings, and rain and water from melting snow would be conducted from the walks by gutters and leaders to present subsurface sewers.

As further traffic-congestion relief, cities should require that all new building construction and extensive remodeling within defined areas make provision for loading and discharging goods, fuel and persons inside the buildings.

The suggested scheme could be carried out progressively street by street and sidewalk elevation extended outward in later years as expansion of the business area required. Work of constructing the walks would create little interference with traffic during the process and would entail minor alteration of subsurface structures and service facilities, such as basement extensions under present sidewalks; water, sewage and steam piping; and electric power, telephone and telegraph cables.

Comment and discussion on this plan will be welcome.

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How We Can Pay As We Ride on Wall Street Turnpike

By Robert A. Burch (Mem., ITE)
Traffic Engineer, N. C. State Highway & Public Works Commission, Raleigh, N. C.

AT PRESENT there are two systems in use for providing motor vehicle transportation facilities. The system of building and maintaining tunnels, bridges, ferries, and roads by governmental agencies with funds derived from taxes is the one that has accounted for the majority of facilities now available. The other method is to build needed facilities by private interests with authorized bond sales for the financing; with provision made for the collection of toll from the *user only* to provide funds for retirement of bonded indebtedness. The intent of this paper is to suggest a third system for providing road facilities.

Through all ages progress and development have been contingent upon transportation. No form of transportation has had a greater impact than the motor vehicle in determining and shaping growth and progress of the country.

Present financial structure does not permit the provision of transportation facilities as rapidly and to the extent desired. Income to Federal, State, and Local agencies is not sufficient to build modern highways of proper design to meet the needs. Realizing this inability of government agencies, supplementary means have been resorted to—in the form of toll roads.

Comparatively few toll roads have been built; the Pennsylvania Turnpike and Connecticut's Merritt and Wilbur Cross Parkways being the most outstanding examples in the East. Most of these toll facilities are collecting toll for retiring bonds at a rate exceeding original estimates. One outstanding exception to this is the Maine Turnpike from the New Hampshire border to Portland, Maine, where past revenues have not been sufficient to meet requirements. The Robert E. Lee Bridge in Richmond, Virginia, is an example of what can be accomplished with the toll method of financing, where this facility was available to public need well in advance of the time that it would have been built by public taxes. Its toll collections far exceeded expectation, and as a result the bonds were retired several years in advance of the scheduled date and the bridge was turned over to the city for operation as a toll-free facility.

The toll-type of facility will never meet the needs on a nationwide scale because they can be built only in the few places where traffic volumes are so dense that people are willing to pay additional funds for free movement. They can not be proven economical at many places where modern facilities are needed and warranted. The entire theory of toll roads is very questionable and has been discouraged by many agencies.

The Bureau of Public Roads has advanced very real and conclusive facts as to why the toll road method is not the proper approach to the solution of our transportation problem. The Bureau points out that many additional and expensive facilities have to be built for the purpose of collecting tolls; that manpower required at these toll stations increases the cost of driving, without having the money applied to better or additional facilities; that the toll system of roads does not enable drivers operating on these facilities to benefit from any of the high taxes paid for roads. The toll road creates an additional levy, with a large percent of the money going towards the wasteful purpose of collections.

As a substitute for the toll system, and as a supplement to the activities of our present governmental agencies, it is recommended that the banking interests be authorized to form turnpike commissions to build modern facilities with funds secured from the issuance of bonds. This designated authority would be paid or authorized to receive the gasoline tax on that gas which is used on their facilities. In other words, the new facility which is built by the banking interests would be authorized to receive the earnings from the road which they had provided to the extent of the tax equivalent to the vehicle miles over this road. All State and Federal gas taxes now collected would be prorated back to the new private road in proportion to its earnings.

This raises the point as to just how the earnings of any one road can be determined. It is felt that a very accurate determination can be made of the vehicle miles of any road by frequent placement of automatic counters along the road. These automatic traffic counters would be very inexpensive, and from their recorded traffic volumes and predetermined distances a reasonably accurate estimate of vehicle miles could be made. Then working backwards, to convert this into money from the total vehicle miles, the number of gallons consumed on the section could be determined. From the gallons of gas used it would be easy to determine the revenue derived from the facility.

The above suggestion may be termed as a "crack-pot" idea. Sometimes a pot with a very severe crack may be welded to a point that it is usable. The suggestion is very simple and deemed workable. In fact, it is now workable to some degree in a similar manner that gas tax refunds are made. For example, the farmer has gas tax refunds for the gas used in motor equipment on his property, and states have gas tax refunds to certain departments where public vehicles have been used in public interest. It appears that this proposed method of financing would enable us to have road facilities that we could get in no other way. Certainly the most worthy projects would be built because bankers would investigate earning possibilities of the facility before putting their money into the construction bonds. Although the idea is original, it is not incorporated and any one is free to try to put it into operation. Certainly the suggestion is fair and is in keeping with our democratic principles in that it taxes those who benefit, and does not levy against those who are not served.

Effectiveness of Lane Markings on Urban Turning Movements

By Paul W. Rice (Jun. Mem., ITE)
Traffic Engineer, Tulsa, Oklahoma

After studying right-turn movements at a heavily-travelled intersection of one-way streets, the author finds that the provision of a curved paint material improves operation and proves an effective means of channelization.

THIS paper deals with traffic behavior while negotiating a right turn with a heavy stream of traffic. Study of driver action was made before and after a white paint line, separating the two turning lanes, was applied to the street surface. An attempt was made to locate the paint line in such a manner as to facilitate flow and encourage dual turning movements.

At the intersection of one-way streets there is usually one predominant turning movement. An example is found at the beginning of the one-way street pattern, where the two-way system ends and all traffic from one direction must turn so as to conform to the one-way street pattern ahead. An acute traffic situation thus arises due to the abnormal number of turns into the crossing one-way street.

The area selected for this study was the intersection of Elm and York Streets, in New Haven, Connecticut, for a period during 1948-49, while one-way streets were in effect. At this point two-way traffic ended and all eastbound traffic on Elm Street was required to turn right into York Street. York Street was used for southbound one-way traffic while all eastbound traffic from west of York Street was "funneled" into the intersection on Elm Street. Opposing turns and parked vehicles did not seriously interfere with the right turn studied.

The intersection was signalized and a Police Officer was on duty throughout the hours of the study. The signal was timed for a 50 second cycle, with a 60-40 per cent split in favor of the Elm Street phase of traffic.

During the hours of the study the average vehicle volume turning right was 656 vehicles per hour, of which 9.6 per cent were transit vehicles. The pedestrian conflict to the right turn movement was not acute but did present some obstacles to free flow.

The physical character of the intersection (camera field of view) is shown in Figure 1.

Fig. 1

Field Procedure

The field data were collected by means of the photographic method as described in "Traffic Performance at Urban Street Intersections."[1]

The equipment used consisted of an Eastman Cine-Kodak Special 16mm. motion picture camera, equipped with an auxiliary timing mechanism. The spring-wound timing device, operated the electric camera release as well as the electric counter which appears in each exposed frame.

The timing device was set to operate at the rate of 88 exposures per minute, this rate being chosen because the distance in feet that a vehicle travels in this time equals its speed in miles per hour. The counter also operated at the rate of 88 times per minute, alternating its movement with that of the camera release and was supported within the field of view of the camera lense. The camera was shut off during the "stop" interval for traffic on Elm Street and the counter proceeded throughout the period of study; thus, only the actual turning movements were recorded and film was more efficiently utilized.

Coordinate points were marked at the intersection to reference the film for the construction of the perspective grid. These markings were placed at intervals of ten feet along the curb and in a gridiron pattern over the traveled portion of the street. Six inch squares of chalk were applied to the pavement and curb in each direction, thirty feet from the curb return tangent.

Later field work involved the location and application of the white paint line for the "after" study.

Two hundred feet of film were exposed before and two hundred feet after the paint line was placed. The pictures were taken during the morning rush hours, between 7 and 9 A.M. All field data was collected on week days in the months of October, November and December, 1948.

Office Procedure

Perspective and cartesian grids were used in the analysis of the data. A third type was used to display the findings of the study. The latter is herein called the "analytical grid."

The exposed and processed film was projected onto the constructed perspective grid for detailed analysis. For con-

1. Greenshields, Bruce D.; Schapiro, Donald; Erickson, Elroy L.; *Traffic Performance at Urban Street Intersections*. Technical Report No. 1, Bureau of Highway Traffic, Yale University, 1947.

Mr. Rice, Class of '49, Yale Bureau of Highway Traffic, presents the ninth in the series of feature articles based on student thesis requirements.

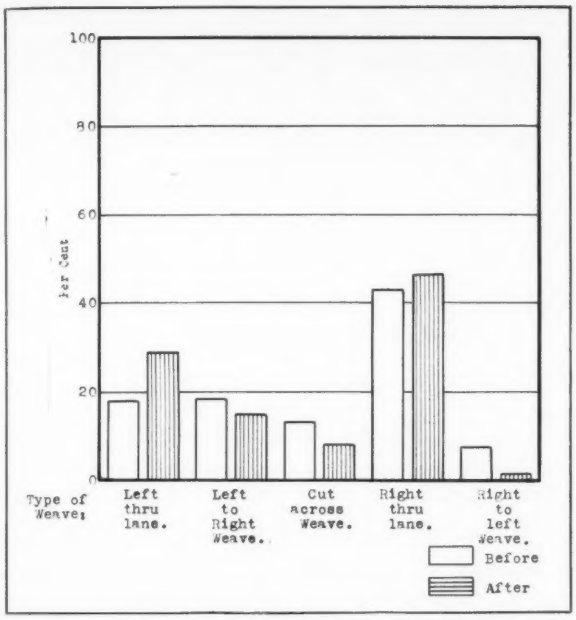

Fig. 2
Weaving, random arrival—200 vehicles.

venience, the projector was mounted overhead so as to provide an image on the "screen" of white bristle board, upon which the perspective grid was drawn. The grid was also more easily positioned to fit the image when projected on a horizontal surface.

It was advantageous to advance or reverse the film at will. This was done with the aid of a mechanical arrangement as described in "Traffic Performance at Street Intersections." With such an arrangement, it was possible to trace the vehicle movement through the intersection prior to analysis, then by reversing the projector to the start of the movement, record the data for each individual frame.

It was possible to plot the position of each vehicle to an accuracy of one-half foot. In all cases the outside (left) front wheel was used as the point of reference. Coordinate location points were recorded for each vehicle studied and in each frame shown. The following data were taken from the film:

(1) Position of each vehicle in each frame
(2) Placement of vehicles in dual movement
(3) Headway, or clearance time (in frames)

As was previously stated this study was confined to the passenger unit. Though conflict was evident, an attempt was made to select vehicles and cycles with a minimum of pedestrian and vehicle interference.

Information on each vehicle was read from the perspective grid and recorded in tabular form. Each coordinate point was then located on the cartesian grid. The points were connected with the aid of a flexible curve, thus the vehicular path as described by the left front wheel was determined. This was repeated for each vehicle movement studied.

From the tabulated data, and the reconstructed path of the vehicle, the following information was determined:

(1) Placement of each vehicle (left front wheel) from the curb at;
  (a) The entrance point
  (b) The mid-point
  (c) The exit point
(2) Spacing between dual turning vehicles
(3) Weaving between the test area
(4) Speed of vehicles at the point of exit
(5) Headway, or clearance time for vehicles to complete the turn (in seconds)
(6) Number of vehicles clearing the turn in a given cycle

The actual physical space occupied by the vehicle was considered, using the average tread width of five feet, and average vehicle length of eighteen feet. The left front wheel was designated as the reference point, and all measurements were referenced to that point for actual space location.

The space width occupied at the mid-point of the turn was determined by calculation and construction, to be eight feet. The vehicle turning radius at that point was not minimum as the curve was a form of transition. Therefore, the actual width utilized was less than the average of 8.7 feet[2] ordinarily used for a turning vehicle.

There are four types of maneuvers common to multiple lane operation. A fifth was determined in this study and is believed common only to vehicles on a curve or turn. The four common to two-lane operation are: (1) Right lane throughout, (2) Right to left lane weave, (3) Left lane throughout, (4) Left to right lane weave, and a fifth variation was the "cut-across" weave. The "cut-across" weave started in the left lane, crossed into the right lane at the mid-point of the turn, and finished the maneuver in the left lane.

All movements were analyzed between the point of curvature and the point of tangency of the curve; or simply in one quadrant of operation only.

Location of Lane Line

A comparison was made of the lateral position of vehicles at the entrance and exit of the turn, before the lane line was in place, to determine the optimum location.

At the point of entry the left front wheel of the right lane vehicle was more often located within the thirteen foot section. The outside or left lane was grouped at nineteen feet and over, thus designating the neutral lane line location at thirteen feet from the curb opposite the point of curvature on the street of entry.

The lane line was extended fifty feet into the street of entry and because of the wide "funnel-shaped" layout of the street, was angled out to a point seventeen and one-half feet from the curb at fifty feet from the point of curvature.

There was little selection on the street of exit. The thirty-six foot street was divided and the paint lane was applied to the turn in a transition form so as to run from a point thirteen feet from the curb at the point of entry, to a point eighteen feet from the curb on the street of exit.

Position of Vehicles

At the entrance of the turn, the before study found 49 per cent in the right lane. After the line was added, 43 per cent use the right lane. Sixteen per cent were straddlers of the line location area before, as against 18.5 per cent after. The only particular improvement was in the left lane where 35 per cent were in that area before, as against 38.5 per cent after the lane line was down.

The mid-point of the turn is the common ground where the weaving movements were concentrated. Results showed that 61 per cent of all vehicles of the before study were within the right lane at the mid-point, and 59 per cent afterwards. Straddlers comprised 27.5 per cent before and

2. American Association of State Highway Officials, *A Policy on Highway Types (Geometric)*. pp. 27, 1947.

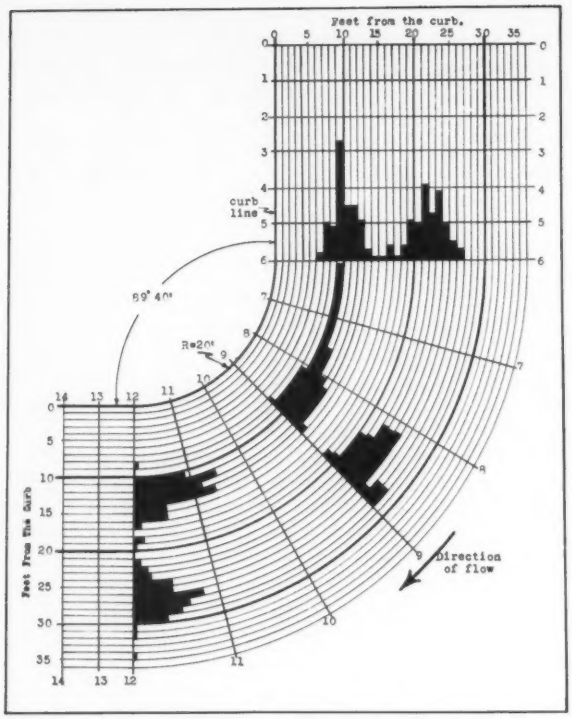

Fig. 3

Before placement, dual movements—100 dual turns. Left front wheel.

23.5 per cent after. Only 11.5 per cent were in the left lane before as against 17.5 per cent after, to show an improvement for that lane at the mid-point.

Positioning at the exit is not as critical as the other two locations on the turn. The vehicles normally flow freely into the two available lanes. Results indicated that 57.5 per cent were in the right lane before, as against 60 per cent after. Straddlers comprised 12.5 per cent before and 12 per cent after. The left lane carried 30 per cent before and 28 per cent after. While there was no startling improvement at the exit, it was observed that more vehicles were channelized at the exit and thus fewer line straddlers.

There was a scattering of vehicles throughout the turn both before and after the lane line was down. There is, however, in each case, a definte peak of vehicle placement both right and left of the lane line.

Figure 2 gives a summary of the before and after comparison, analyzing each vehicle turn throughout. To simplify; a straddler at the entrance who ended completely on either side of the lane line, was considered a weaver from the opposite side. A vehicle entering in one lane and ending a straddler, or in the opposite lane, was considered a weaver from the original lane to the opposite lane. The "cut-across" maneuver was also displayed in Figure 2 for comparison and to show the improvement.

Dual Movements

One hundred dual movements, both before and after, were analyzed to determine lateral placement throughout the turn. Figures 3 and 4 show the placement of vehicles with respect to the curb. These two figures show concentration of the vehicles, but it does not show the relationship of the two vehicles during any dual turn.

By eliminating or subtracting average width from the outside vehicle placement, the space between vehicles was obtained. At the entrance, the space between vehicles was reduced from an average of 6.65 feet before to 6.39 feet after. There is also a slight decrease in the space between vehicles with the addition of the lane line. The greatest change was observed at the exit point where the space between vehicles was reduced from an average of 8.62 to 7.61 feet after the lane line was down.

Speed

As some vehicles were stopped by the traffic signal, and others were not, the speed was taken only at the point of tangency of the street of exit. At that point only was there a reasonable basis for speed comparison.

Top speed after the lane line was in place, was lower than before. The peak or modal speed afterwards falls in the lower speed range.

The noticeable feature of the after study speed range is the smooth dispersion of the range of values. There was also a greater range of values for the after study than in the before study. Speeds from six to twenty miles per hour were recorded in the after study with gradual increase to the peak and then a smooth gradual decrease. The before study ranged from eight to seventeen miles per hour with an abrupt rise at ten miles per hour, and an abrupt decrease at fourteen miles per hour.

The 85 percentile speeds were determined from the cumulative speed curves, and there was little difference in the before and after study. Only 0.3 mile per hour difference was found for the 85 percentile value, with after study giving the lower speed. Either speed average (before or after) is within the standard deviation limits of the other.

The speed of the dual movements present a different result. The general overall pattern for the left lane vehicle

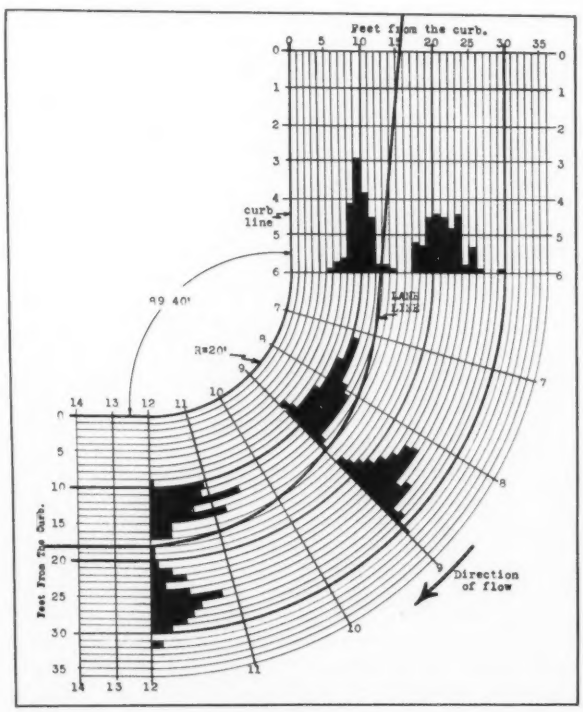

Fig. 4

After placement, dual movements—100 dual turns. Left front wheel.

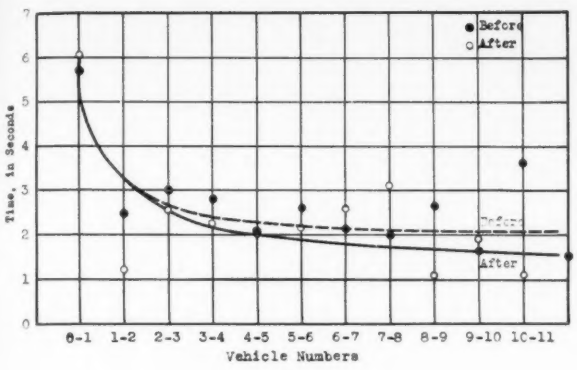

Fig. 5
Time headways, to clear intersection.

was somewhat the same as the random sample of speeds. There was a difference in the 85 percentile value for the left lane of 1.25 miles per hour decreasing from 14.25 miles per hour to 13.00 miles per hour before and after. This speed does somewhat parallel the speed of the random sample with 85 percentile values of 13.4 miles per hour, before and after, respectively.

The right vehicle of the dual movement seemed to suffer from the "squeeze" which was reflected in the lower speed values. The 85 percentile values for the right vehicle speed was 12.4 miles per hour before and 11.3 miles per hour after. The speed range for the right vehicle was short, ranging from 6 to 15 miles per hour. This was less than for any other movement studied.

The speeds in all cases were reduced in the after study. The 85 percentile and average values of speed in each case showed a decrease after the lane line was added.

Clearance Time

The time in seconds, for the first and successive vehicles to clear the intersection turning area is indicated in Figure 5. Average values were used. The curves indicate a small but definite decrease in clearance time of each vehicle following the first in line, in the after study.

Only 31 cycles were checked before as against 35 after, representing about 250 vehicles in each case. Though the sample was small, the trend is significant and is considered to represent improvement in headway and clearance times.

Summary

Following is a summary of the study findings of driver reaction to lane line application in an urban intersection right turn movement:

1. In regard to placement, random turning vehicles showed little improvement, while there was a slight increase in usage of the left lane, and dual movements better utilized available space by driving nearer to each other in the turn.
2. The effects on weaving movements were: an increase in through lane movement, a substantial reduction in inter-lane weaving, and 40 per cent reduction in "cut-across" weaves.
3. The speed of vehicles leaving the test area was decreased slightly, while dispersion of the speed ranges showed a smoother and wider distribution in each case.
4. Though the sample for clearance time was small, a decrease was recorded for each vehicle to "clear," except the first in line, so that less time was needed for an equal number of vehicles to clear the intersection.

Third Vehicular Tube For Lincoln Tunnel Proposed

Howard S. Cullman, chairman of The Port of New York Authority, recently announced the plans of the bi-state agency for an immediate $120,000 engineering study of the new two-lane tube at the Lincoln Tunnel to augument the two existing tubes and facilitate the movement of traffic through that key trans-Hudson artery.

"The Holland and Lincoln Tunnels and the George Washington Bridge are jammed to capacity or rapidly nearing that point," Mr. Cullman said. "At the same time, we have practically reached the capacity of the island of Manhattan to absorb traffic. Our studies indicate, therefore, that solutions must be found which will make it possible for New Jersey, Westchester, Brooklyn and Long Island traffic to by-pass the crowded island north and south, and, where this is not possible, to move directly over the island and under the island. In other words, if we are to deal realistically with the traffic problem in the metropolitan area, we must go around, over or under surface street congestion."

The action of the Commissioners was based upon the traffic conclusions reflected in a survey of the movements of interstate vehicular traffic which the Commissioners of the Port Authority had authorized on September 8, 1949.

The pressure on the Holland Tunnel and the Lincoln Tunnel indicates a need for early relief in carrying traffic to and from Manhattan. The New Jersey Turnpike will have a direct connection with the Lincoln Tunnel for commercial, as well as passenger cars, and this new traffic will need to be handled at the midtown facility.

This type of traffic could be handled only by adding to the present capacity of the Lincoln Tunnel through construction of a third tube for the Lincoln Tunnel, or by providing an entirely new tunnel located somewhere between the Holland Tunnel and the Lincoln Tunnel, which would provide direct connections with the New Jersey Turnpike. At present, Lincoln Tunnel to New York is nearly double that to New Jersey in the morning. In the afternoon, New Jersey bound traffic is about a third greater than that bound for New York. Preliminary engineering consideration has been given to the possibility of a third two-lane tube at the Lincoln Tunnel which would permit operation of four lanes of traffic to New York in the morning and four lanes to New Jersey in the evening.

It is believed that existing New Jersey approaches will be adequate to absorb this additional traffic when improvements to Route 3 are completed and when the Port Authority completes the construction of its new direct connection from the Lincoln Tunnel to the New Jersey Turnpike.

It is also believed that a third Lincoln Tunnel tube might be accommodated on an altered New York plaza. Changes in the plaza would take into consideration the ramp connection to the Port Authority Bus Terminal, a possible connection from Forty-first Street over the New York Central right-of-way, and such connections as may be desirable to a possible mid-Manhattan crosstown project in the event the City of New York decides to go forward with such a facility.

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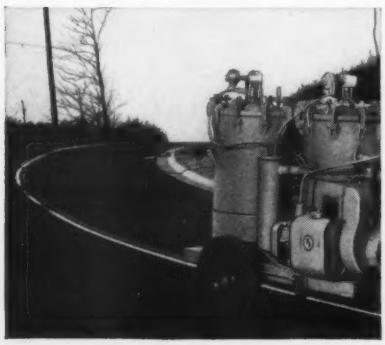

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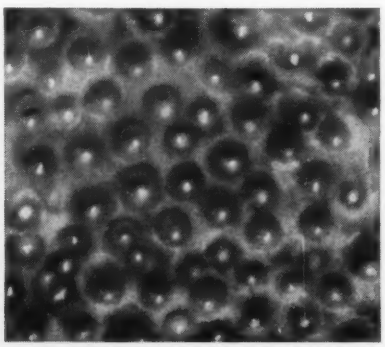

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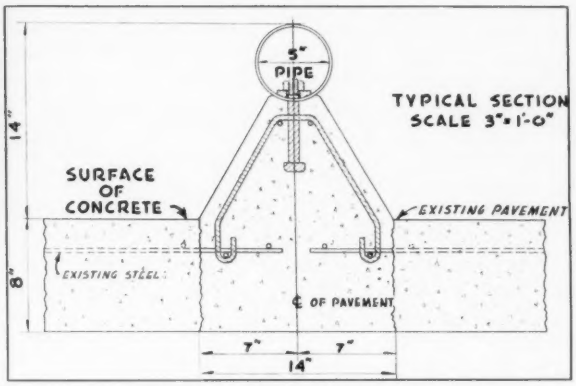
Reference Notes

By Sidney M. Shapiro
Deputy Chief Engineer
Long Island State Park Commission
Babylon, L. I., N. Y.

Centerline Traffic Divider

IN THE course of repaving four miles of the old Southern State Parkway the Long Island State Park Commission is widening it 3 ft. on each side and building a 14-inch high dividing center curb of concrete and 5-in. steel pipe (cost: $7 per lin. ft.). It is planned to install this dividing curb along eight more miles of the Southern State and 6½ miles of the Northern State next year; the entire length of the system will then be divided highway.

Specifications for the traffic divider are available upon request to the Commission.



Center divider. Long Island State Parkways.

Setting of steel pipe on top of center divider, curvature of which is the same as pipe.

POLARIZED LIGHT

(Continued from page 386)

threshold, even a 50 per cent increase in brightness does not alter the ability—or inability—to see. It may, however, contribute to discomfort, but if so, this may make for better conformance with dimming practice. Also note that, as shown in Fig. 8, an "old" car driver may protect himself against misuse of polarized lamps by the simple expedient of using an inexpensive viewer on such occasions. He is then much better off than with today's misuse condition. Among other facts supported by the General Electric data[3] but not reproduced herein are that: (1) From the standpoint of how the user of the older type of equipment is put at a disadvantage by misuse of the newer type, the transition from Sealed Beam to polarized headlighting will be far safer than is the transition from pre-Sealed Beam to Sealed Beam headlighting. (2) The use of an inexpensive conversion polarized system, suitable for application to old cars and requiring no generator change, yields material advantage in the form of maintained visibility distance during the operation of meeting other polarized cars. Making such an auxiliary system available in the same way as Sealed Beam conversion kits were mass-distributed would materially shorten any introductory period for polarized headlighting. All components of such an auxiliary system could be made available to a present car owner for around $12.

Several other schemes have been suggested as possible solutions to the problem of introducing polarized headlighting. All of these attempt to minimize or eliminate the duration of any period of mixed driving. Some suggest compulsory legislation to require the system on all cars after some date. One, for example, suggests that motor car manufacturers might begin now to furnish the heavier electrical system in all cars, but retain the same headlight system. Then, some years hence, when virtually all cars would be capable of handling the heavier load, installation of the special lamps and the viewer, at nominal expense to the owner, would be required by some agreed date. Among other things, the distinct possibility that the heavier generator would, by that time, be loaded to capacity with new-gadget requirements suggests itself.

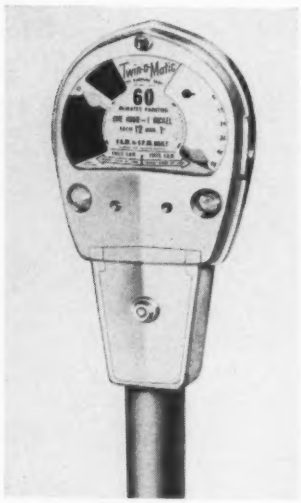
After a long study of such suggestions, we at Polaroid believe that adoption is most practical when based on the following program:

1. Car manufacturers would build the complete system into all new cars beginning on some date to be decided.
2. Through competent accessory manufacturers, an auxiliary polarizing system would be made available to "old" car owners who, at a nominal expense, could then obtain a marked improvement in visibility when meeting other polarized cars.
3. Polarizing viewers in a form costing less than a dollar would be made universally available to all car owners so that they might have a means for protecting themselves against occasions of misuse of the new lights—a privilege which no driver enjoys today.
4. *Permissive* legislation would be enacted by the states, amending those parts of the Uniform Vehicle Code which restrict the maximum beam candlepower and the beam distribution.
5. A well directed educational program would be carried on by safety and consumer-representative groups so that a well-informed and not over-expectant public would be certain to derive the greatest possible benefit from the system both during and after introduction.

[3] *Traffic Engineering;* January, 1949, Page 151.

New Parking Meter Announced

A new parking meter that is said to combine all the desired parking meter features is the automatic Twin-o-Matic Meter, now being introduced by The Karpark Corporation of Cincinnati, Ohio.



The Twin-o-Matic Meter, of compact, modern design, is constructed with two independently operating meter mechanisms in one housing. This permits the parking of two cars at one meter, thus reducing by half the number of meter installations required, with consequent lower initial cost and lower maintenance and servicing costs. In addition, only one standard installation is required instead of two, and the size of this standard can be either 2″ or 2½″ in diameter.

There is also a companion meter for the timing of single cars. Similar in design, and used at street ends and special one-car locations, it makes it possible to maintain a uniform appearance among all the meters on the streets.

Coin and time requirements in the Twin-o-Matic are easily changed on location in a matter of minutes, thus permitting quick adjustments to any desired change in parking regulation. The timing mechanism, powered to operate more than 100 hours on one winding, is entirely separate from the coin mechanism.

Another point of interest is the fact that the Twin-o-Matic offers a choice of either fully accumulative or non-accumulative timing. This allows leeway in traffic planning and permits specific adjustment to any particular locality.

Meters in the Twin-o-Matic operate independently of each other and are easily and quickly interchangeable, permitting shifting from one installation to another, and from the twin to the single housing. Besides making it easy to make adjustments to meet parking practice revisions, this interchangeability facilitates servicing.

Another advantage, especially appreciated by parkers, is a small opening in the dial through which motion in the mechanism can be observed, making it possible to check operation after insertion of the coin.

Housing of the Twin-o-Matic is constructed of a new aluminum alloy of exceptional hardness and tensile strength to resist damage, wear and corrosion. There are no seams through which moisture and dirt can seep to the mechanism, and the sturdy housing also prevents tampering and pilfering.

The heavy duty precision mechanism is made of high grade clock brass, 18-8 stainless steel, aluminum, heat treated Monel metal and Berryllium copper, and is completely rust-proof. The gears and pinions are machine cut from extra heavy brass and stainless steel.

Karpark Twin-o-Matic Meters, like the Karpark Superior and the Karpark Husky meters, are built by The Herschede Hall Clock Company, which has been famous for more than three generations, for the accuracy, reliability and fine craftsmanship of its clocks. Since parking meters are essentially timing devices, this vast experience is a valuable asset in their manufacture, as has been proved during the more than 15 years the Herschede Company has been making Karpark parking meters.

ON THE SHELF

National Advisory Committee for Fleet Supervisory Training
Instruction outlines. Driver training and accident prevention for the fleet. Institute of Public Safety at Penn. State College and the Committee, 1949. Variously paged. n.p.

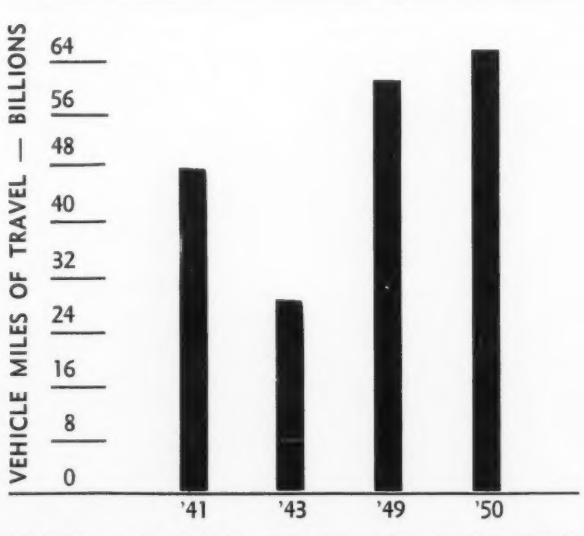
National Commission of Safety Education
College and university traffic training. Washington, D. C., The Commission, 1949. 12p. 20c.

National Committee for Traffic Safety
Building traffic safety into residential developments. Washington, D. C., The Comm., 1949. 40p. $1.00.

National Committee for Traffic Safety
Traffic safety organizations with field services. Chicago, The Comm., 1949. Unpaged. $4.50.

Owen, Wilfred
Automotive transportation, trends and problems. Washington, D. C., Brookings Institution, 1949. 154p. $2.00.

Traffic Trends



TRAVEL ON RURAL ROADS FOR FIRST FOUR MONTHS OF 1941, 1943, 1949 and 1950.
Based on Bureau of Public Roads Data

TRAFFIC NEWS

$150 Million For Rural Local Roads

County roads serving only local traffic would be eligible for Federal financial assistance under provisions of a proposed Federal-Aid Highway Act of 1950 introduced by Senator Dennis Chavez, of New Mexico. A new Federal-state-county relationship would be established to funnel Federal-aid and state-appropriated highway funds into construction and maintenance on the approximately 2,400,000 miles of rural local roads not now on Federal-aid systems.

The bill would authorize $150 million of Federal funds during the two fiscal years beginning July 1, 1950, "to be used in the administration of and the carrying out of a construction program on 'county' roads under the supervision of and with the approval of the Bureau of Public Roads." This fund would be available immediately, whereas in other sections of the bill the traditional Federal-aid funds would be authorized for two fiscal years beginning July 1, 1951, and July 1, 1952.

A three-way matching formula directs that the Federal government bear 40 per cent, the state 25 per cent, and the county or parish 35 per cent of the cost of projects on local rural roads, with the cost to the Federal government limited to $4,000 a mile. Observers point out that this arrangement would require states which do not provide for expenditures of state highway funds on local roads to take special legislative action to meet requirements of the program.

Prior to relocation or realignment of any Federal-aid rural road so as to bypass any city, town or village, the Senate bill directs that the Bureau of Public Roads shall study the economic effect of such action on the affected city; shall give advance public notice of the planned relocation; shall offer opportunity to the city to provide necessary right-of-way for improvement of existing route; and, "if sufficient right-of-way is made available and there are not other factors of major importance then no realignment or relocation will be made." Any proposed realignment or relocation, however, would require approval of the governor of the state.

Other annual authorizations in the Senate bill include forest highways, $25 million; forest development roads and trails, $20 million; roads in national parks, $15 million; access to national parks, $15 million, and roads on Indian land, $10 million.

In addition, the bill would include an $8,000,000 annual authorization for eight years for assistance to Central American republics in construction of the Inter-American Highways; $8,000,000 for assistance to Nicaragua in completion of a road from San Benito to Rama; and a $50 million fund to be available until expended for access roads to military and defense industry installations.

Improved Signposting

A B.R.F. PAMPHLET

It is understood by the British Road Federation that official efforts will be made during 1950 to bring about some improvements in the standards and continuity of British signposting. The need for such improvement is emphasized in the Federation's latest publication, *Follow the Signposts*. This story describes how, during the summer of 1949, an American driver spent an hour and a half trying to discover the road from London to Cambridge. However extraordinary it may seem to prefer looking at the signposts instead of a street plan for such a purpose, there is no doubt of the need for improved signposting. The B.R.F. points out that it would be impossible for signposts in the heart of London, or other large cities, to show the way to a large number of towns, but at least main trunk routes should be indicated.

Improved Signs

County and municipal authorities are dealing with this and other problems in their extensive schemes for speeding traffic on its way. Particular attention is being paid to the installation of more "approach direction" signs which are located some distance before road junctions to supply drivers with advance information. The Ministry of Transport and the Association of Road Traffic Sign Makers are carrying out experiments to provide even distribution of lighting to the face of these signs. The result of these valuable tests will probably be announced in the near future. Reflector (reflex) signs will continue to appear along county roads and in ill-lighted suburbs. A standard height of 3 ft. 6 in. will be maintained for all signs except in urban areas, where signposts will be 6 ft. 9 in. in height for satisfactory purposes.

International Symbols

The suggested system of international symbols has not been adopted by Great Britain, the British Commonwealth, America, and some countries, but there is a proposal that this subject should be reviewed internationally in two or three years' time to see whether a compromise world system might not be evolved. Traffic sign makers are engaged in a heavy production schedule and are concentrating on the need for speeding-up production of high quality signs. The B.R.F. has consistently advocated improved road signs. The task of their erection should be an official responsibility and not, as in the past, left mainly to private motoring organizations.

Modern Transport

Meter Funds for Parking

Highway users are seeking a fiscal reform in a new direction.

Long opposed to diversion of highway use taxes to spending for non-highway purposes, they are now interested in having the multi-million-dollar proceeds from the nation's parking meters go into the improving of parking, rather than into the general funds of cities and towns.

A resolution adopted by the Third Highway Transportation Congress, National Highway User Conference, asked that where parking meters are installed net proceeds from them be used for the improvement of the parking situation, especially the development of off-street parking facilities.

Death Rates vs. Periodic Motor Vehicle Inspection

Even though one may concede that periodic motor vehicle inspection is not entirely responsible for the fine traffic accident fatality record of states having such a program, the fact remains that states having regular periodic motor vehicle inspection programs are far out in front in reducing the traffic accident fatality toll. This is clearly evidenced by the table below:

Please note that this table is based on the latest available 1949 fatality figures released by States which accounts for a slightly different national average than the *estimated final rate* recently released by the National Safety Council.

A Bulletin devoted to information in the field of Periodic Motor Vehicle Inspection furnished by correspondents throughout the Nation . . . Issued by Accident Prevention Department, *Association of Casualty and Surety Companies*, 60 John Street, New York 7, N. Y.

	Average Death Rates Per 100 Million Vehicle Miles		Percentage That 1949 Average Death Rates Are Above Or Below National Average
	1948	1949	
National Average	8.0	7.0	
States Not Requiring Inspection	8.1	7.2	+ 2.9%
States Requiring Inspection:			
All States	6.9	5.9	—15.7%
States Having Private Inspection Stations Appointed by the State	7.3	6.4	— 8.6%
States Having State Owned and Operated Inspection Stations	6.2	4.6	—34.3%

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Michigan Safety Conference

The Traffic and Planning Section of the Michigan Safety Conference presented a two-day program for the edification of public officials and employees interested in traffic engineering and allied fields on May 17 and 18, 1950, in Detroit, Michigan.

The program was arranged and participated in by the following: Al Malo, Chairman; Sidney Anger, Al O. Cuthbert, Ray Eastman, Oscar M. Gunderson, Ross C. Harger, Russell E. Harrison, John C. Kohl, J. Carl McMonagle. Other participants included Roger Morrison, Prof. of Highway Engineering and Highway Transport, University of Michigan; Arthur Bromage, Prof. of Political Science, University of Michigan; Jerome D. Franklin, Traffic Engineer, Grand Rapids, Michigan; James R. Wichman, Traffic Engineer, Kalamazoo, Michigan; John W. Hyde, Prof. of City Planning, University of Michigan; J. D. Cruise, Highway Planning Engineer, Michigan State Highway Department; R. Fernbach, Highland Park, Michigan; and M. C. Shepherd, Birmingham, Michigan.

Following each lecture, a panel discussion was held to present the practical aspects of the problems discussed.

Each session of the conference was packed and those in attendance were well pleased with the presentation of the various principles of traffic engineering and the examples of the practical applications useful in their own work.

Members of the Michigan Section, ITE, were entertained by the Automobile Club of Michigan at a luncheon on Wednesday. William Potts, Safety Engineer for the A.A.A., was the host.

The New Denominator

Well over a quarter of a century ago, the Cranford Company was constructing a subway in Brooklyn, New York. Mr. Frank H. Morse, then auditor and paymaster, recognized the need for a simple tabulating machine to denominate cash payrolls. It might well be said that the tedious task of determining the exact number of each bill and coin to be obtained from the bank in order to fill thousands of laborers' pay envelopes led to the development of the Denominator.

Shortly after the introduction of the payroll Denominator, it was found that there were many other widely diversified applications—Food Control, Sales Analyses, Stock Control, Inspection Tabulations, Differential Blood Counts, Inventory Analyses, Traffic Control, etc.

Today, at 216 Broadway, New York 7, N. Y., The Denominator Company, Inc., makes tabulating Denominators in flexible multiple units of from one to 180 registers. Special totalizer units which accumulate the recordings of the individual registers are also available. Units and totalizers are constructed with four wheels which record up to 9,999. A complete revolution of the reset knob returns all registers to zero.

By simply depressing the spring-actuated cover of the individual units of the Denominator, the dials record your count. Even where a large number of Denominator registers are used, the sharp black Gothic numerals on the clear white surface of the dials are always clearly discernable. Items, brands or symbol characters or titles are clearly in view on the classification strip on the face of each tabulator. These strips are readily removed and are furnished in various colors to aid the operator in locating particular classes of items.

The new Tally Denominator, which has been recently added to this Company's tabulating machine line, is of similar construction to the individual unit described above. This compact tally is equipped with an adjustable spring to slip over the operator's finger and fits snugly in the palm of the hand. It is actuated simply by closing the hand.

In all fields, control of the flow of production, parts, materials, products, services, and finances is absolutely necessary for successful management. At various stations, whether few or many, "Keeping Count" is of vital importance and is the keynote of successful operation.

Further detailed information on the Denominator can be had from the manufacturer.

Montreal to Operate Public Transportation System

The Legislative Assembly of Quebec recently passed an Act to amend the charter of the City of Montreal, following the report of the city's Board of Research on Traffic and Transportation Problems. Charles E. Campeau, Member, ITE, was Secretary of the Board. The Act authorizes the city to establish a Montreal Transportation Commission to organize, own, develop and administer a general system of public transportation for the benefit of the population of the city and the Metropolitan district. The Act further provides for the complete exproportion of the Montreal Tramways Company.

GETTING RESULTS

THROUGH TRAFFIC ENGINEERING

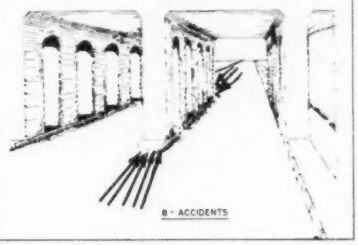
NO. 12

TRAFFIC SITUATION No. 12 — TRAFFIC HAZARD MADE VISIBLE ELIMINATES ACCIDENTS

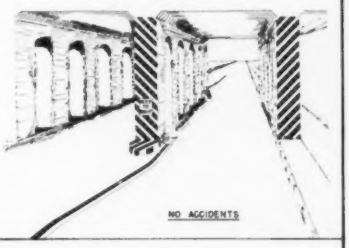
PROBLEM:

The ratio of night to day accidents was out of proportion at the Michigan Central Railroad and Lonyo Road viaduct. A center abutment dividing the roadway, and poor visibility at night were a contributing cause to accidents during darkness.

BEFORE



AFTER



ACCIDENT FACTS:

Eight accidents injuring 16 vehicle passengers occurred in a twenty-four month period. All vehicles crashed into the center abutment of the viaduct during darkness and all crashes were caused by the vehicle operators not being able to discern the center abutment far enough in advance to avoid an accident.

FIELD STUDIES:

The visibility of the hazardous abutments was found to be extremely poor during darkness. A few hundred feet back from each side of the viaduct are two archaic street lamps that do not materially aid seeing, and there are no residences or stores on Lonyo Road for about a mile on each side of the viaduct; consequently, Lonyo Road is similar to a dark country byway.

SOLUTION:

The need was to improve the factor of visibility since the hazardous abutments must be made visible for night vehicle traffic. In designing the improvement, standard practice was conformed to as closely as possible. On pillars at both entrances black and white diagonal stripes were painted, and a reflectorized "Keep to Right" sign was erected at each end of the center abutment. A yellow centerline was painted which on approaching the dangerous middle abutment, guided vehicles safely around the hazard. A white line was painted next to the yellow centerline where it curved around the center abutment.

CHECK BACK:

Since the change was effected there have been no accidents in a seven-month period. The cost of the improvement was less than $40.

Issued by the Accident Prevention Dept., Association of Casualty & Surety Companies, 60 John St., New York 7, N. Y. Mr. Koch was with the City of Detroit at the time this example was submitted.

Example Contributed By
Harry C. Koch
Assoc. Traffic Engineer
Detroit, Mich.

Small Danger Areas

The most dangerous night accidents occur on a comparatively small portion of the city street mileage, and still a smaller portion of the highway mileage outside of cities, The Street and Traffic Safety Lighting Bureau reports. The principal danger points are approaches to urban areas, traffic arteries running through villages and built up sections between municipalities, heavily traveled city arterials, suburban business districts, and hazardous locations (curves, railroad crossings, intersections).

Wichita Establishes One-Way Streets

The City of Wichita recently established two one-way streets, each of which is approximately 4½ miles long. The two streets are now serving as arteries from the heavy residential district on the east side of the City to the business center. They have been in operation for two months and have met with overwhelming approval by the citizens. The two streets together are now carrying 5,000 more vehicles than they did as two-way streets. The peak hour traffic on the one-way street leading from the business district has almost tripled since the one-way operation went into effect. The time for driving the 4½ miles has decreased from 13.9 minutes to 10 minutes. The agitation now is for the creation of at least one pair of north-south one-way streets to further facilitate the movement of traffic.

Secretary's Column

In the lead article for the May issue of *Traffic Engineering*, Mr. Charles M. Zeigler, State Highway Commissioner of Michigan, made a statement that your Executive Secretary deems worthy of repetition. Mr. Zeigler states as follows:

"Having been in the business of highway administration for quite a number of years, I have had opportunity to watch the gradual development of the talents and usefulness of the traffic engineering profession. I remember about its early struggle for what it considered adequate recognition. Frankly, I think some of those troubles were due, in some cases at least, to being more concerned with establishing traffic engineering as a profession than with developing the solid basis of facts and principles which professional standing requires."

Mr. Zeigler goes on to state that during the past fifteen years traffic engineering has come into its own. Sometimes we have the feeling that there still lingers some of the old troubles. Many "outsiders" realize that traffic engineering is nationally recognized as a highly specialized branch of the engineering profession. These same individuals deplore the fact that the Institute is "highly discriminatory" in electing new members into the fold on the one hand while showing little evidence of the development of basic facts and principles on the other.

It is true that fifteen years of active individual and technical committee work has produced only two technical specifications (relating to traffic signals) and the "Traffic Engineering Handbook." This relatively slow production appears to be only a part of the "growing pains" of any young and vigorous organization. The increased tempo of activity in the past few years will soon produce several brand new specifications, a revised edition of the "Traffic Engineering Handbook," and a loose-leaf *technical notebook*, containing complete projects of ITE technical committees, and a traffic engineering textbook. Surely this is "the solid basis of facts and principles which professional standing requires."

It behoves each member to continue their endeavors to interest *qualified* engineers in joining with us in our efforts to produce these facts and principles. Each member can also help *produce* these facts and principles by participating directly in the work of technical committes or advising the respective chairmen concerning the source of valuable and constructive data.

In the meantime we will make every effort to avoid the stigma of strict professional conservation and show the world that we are vitally concerned with the development of basic facts and principles to effectuate *the safe, convenient, and economic transportation of persons and goods.*

Robert S. Holmes

SECTION NEWS

New York Metropolitan Section

On Thursday, April 27, 1950 the regular meeting of the New York Metropolitan Section was held at the Presidents Tavern in New York City. in the absence of President Ed Wetzel, Herb Keegan, Vice-President, presided over the meeting which was attended by approximately 15 members and guests. After a short business meeting, Herb Keegan introduced the speaker, Mr. Leo R. Welch, Supervisor of Safety Education, New Jersey Division of Motor Vehicles.

Mr. Welch discussed the background of the traffic problem, emphasizing the need for the planning of new expressways and other facilities and also the need for improving existing facilities. In order to accomplish such improvements, he said, coordination of the activities of individuals and groups interested is necessary. Facts must be secured, and adopted to educate the individual motorist who neither knows nor understands the facts unless they are presented to him in a proper manner.

Although it is important that traffic control devices and other engineering improvements be used for the expedition and safety of traffic movements, it is also necessary that the individual motorist be properly informed as to the use and purpose of these improvements.

Mr. Welch stated that closer cooperation by enforcement officials is an important part of such an educational program. Since most police departments are short on manpower, qualitative enforcement should be emphasized.

The organization of this kind of activity in New Jersey was explained by Mr. Welch. A Coordinating Committee made up of traffic, safety, enforcement and education officials has been organized on the three levels of government-state, county and local. The educational activities of the State Coordinating Committee must be generalized because of the wide scope of the field to be covered. There is great need to hit the public at much closer range and with greater accuracy, and this is the job of local Coordinating Committees. Mr. Welch said that the Engineer is in the middle of this program, either finding himself as an important cooperating member of such a Committee, or actually directing the program. In many cases, the entire job of promoting safety education is left with the Engineer in addition to his other duties.

Mr. Welch concluded by saying that the job of educating the public has just begun and although long strides have been made, activity must be carried on at an increasing rate.

On May 22nd, President Wetzel appointed Merwyn A. Kraft, Stanley T. Siegel, and Edmund T. Keenan as a Nominating Committee to select a slate of candidates for the offices of President, Vice-President and Secretary-Treasurer of the Section. The election of officers will be held at the Annual Meeting on June 29, 1950.

Reported by Stanley T. Siegel
Associate Editor

University of Michigan Student Chapter, ITE

The Fall semester of the 1949-50 academic year witnessed the establishment of the University of Michigan Student Chapter of the Institute of Traffic Engineers. The organizational meeting was held on November 1, 1949.

The activities of the Fall semester were mainly organizational in character. Such questions as the election of officers, the enactment of a constitution, and University recognition of the chapter as a qualified student organization had to be acted upon. Time was found, though, to have guest speakers at one of the meetings. These gentlemen were J. Carl McMonagle and Frank C. Eisenach, both of the Traffic Engineering Division of the Michigan State Highway Commission.

The Spring semester started with a new slate of officers in office. Activities during this period were directed towards carrying out the aims of the chapter as outlined in the constitution and towards assuring the permanency of the chapter. Consequently, great speakers were invited to discuss subjects of interest to the traffic engineer. Such speakers were:

Alger F. Malo.....Traffic Engineer
City of Detroit

Capt. Rolland Gainsley
Chief of the Traffic Bureau
Ann Arbor Police Dept.

Matthew Sielski
Chief Traffic & Safety Engineer
Chicago Motor Club

The chapter is grateful to these gentle-

men for their willingness to devote some of their time to addressing this student group. The showing of movies was another activity.

To insure the permanency of the chapter new members were recruited. Officers were also elected to preside over the chapter's activities in the coming fall semester.

The chapter was invited to attend the meeting of the Michigan Section of the Institute of Traffic Engineers at Ann Arbor last January.

This completes the record of the University of Michigan Student Chapter of the Institute of Traffic Engineers for the 1949-50 academic year.

Thomas J. Ford Jr.
Secretary-Treasurer

LOOKING AHEAD

AUGUST 13-16, 1950—LOS ANGELES, CALIFORNIA
American Society of Planning Officials. Hotel Biltmore.

AUGUST 21-24, 1950—PASADENA, CALIFORNIA
National Technical Conference. Illuminating Engineering Society. Hotel Huntington.

SEPTEMBER 11-14, 1950—PORTLAND, OREGON
American Association of Motor Vehicle Administrators. Multnomah Hotel.

SEPTEMBER 18-21, 1950—NEW YORK, N. Y.
55th Annual Convention. International Municipal Signal Association, Inc. Hotel Commodore.

SEPTEMBER 24-27, 1950—NEW YORK, N. Y.
Annual Meeting. Institute of Traffic Engineers. Hotel Commodore.

SEPTEMBER 25-27, 1950—LOS ANGELES, CALIFORNIA
American Transit Association. Biltmore Hotel.

OCTOBER 7-12, 1950—COLORADO SPRINGS, COLORADO
57th Annual Conference, International Association of Chiefs of Police. Antlers Hotel.

OCTOBER 9, 10 & 11, 1950—CHICAGO, ILLINOIS
Annual Meeting. National Council of State Boards of Engineering Examiners. Congress Hotel.

OCTOBER 15-18, 1950—NEW YORK, N. Y.
American Public Works Association. Hotel New Yorker.

OCTOBER 16-20, 1950—CHICAGO, ILLINOIS
38th Annual Safety Congress & Exposition, National Safety Council, Stevens Hotel.

Personalities . . .

NATHAN AVINS, a native of Russia, came to this country in 1912, and has lived in New York City ever since. At the *mature* age of 15, he was introduced to the industrial world by way of a 60-hour week in an iron shop. From that time until Cooper Union Institute handed him his B.S. in E.E. in

1919, he was successfully an iron worker, printer, compositor, hat worker, office worker and experimental tester of electrical machinery and submarine motors during the first World War.

After graduation from Cooper Union and finding engineering positions few and far between, he became an electrician, and, just prior to entry into the traffic field, an electrical contractor. He states he was "shipwrecked" financially, along with his betters, in the debacle of 1929, and was then appointed to the Department of Public Works in New York City as an Inspector of Light and Power—a very imposing title.

The "title" seemed to have little to do with his duties, for, three days after his appointment, he was handed the job of laying out a traffic signal system on three avenues in the city. That was his first introduction to the traffic engineering field. In May of 1929, it was his lot to remove the famous bronze traffic signal towers from the middle of Fifth Avenue and replace them with a system of corner post signals along the avenue.

In 1930, Nathan was transferred to the newly created Engineering Bureau of the Police Department, where, he states, he had the good fortune to have as his working colleague, John T. Gibala (Mem., ITE). About this time he decided to take a post-graduate engineering course, and in 1935 was graduated from the Polytechnic Institute of Brooklyn as an Electrical Engineer.

(See AVINS, *page 406)*

ARTHUR J. NAQUIN was born at the turn of the century in Texas but didn't get to enjoy it since his Dad and Mother moved a year later to Louisiana where Arthur received his primary schooling and won an honor scholarship to Tulane University.

World War I interrupted his sopho-

more year in the College of Engineering in favor of a naval reserve enlistment. One month later the war was over and our hero was demobilized. The glamor of the uniform lingered on, however, so our lad of eighteen summers hied himself to San Antonio to work in the U. S. Arsenal and to meet all the *senoritas* in Breckenbridge Park.

Returning to Tulane a year later he completed his undergraduate studies in Electrical & Mechanical Engineering in due time, served as a part time student instructor for two years at his Alma Mater and was then selected by the General Electric Co. for a P.T.M. position (poor test man) at Schenectady. Nine months later he applied for transfer to Erie to study railway motors and control, for the glamor of steam railroad electrification was well nigh irresistable. But did he enter this field? . . . he did not! He went to work for an electric street car company in his own home town . . . at their request. And . . . you've probably guessed it . . . he also married the one-and-only from New Orleans, Miss Anna Baker . . . on Christmas Eve.

Arthur served as Railway Equipment Engineer for New Orleans Public Service Inc. in '26, '27 and '28; as Transportation Engineer in '29 and was then placed in charge of the Schedule and Traffic Division in 1930 which post he held for ten years. During this period he became active in street traffic control matters, served three times as Chair-

man of the Traffic & Safety Committee, Chamber of Commerce, and was admitted to ITE (No. 70) as Associate Member in 1932.

In 1941 NOPSI created a new position of Safety Counselor and named Naquin to that post to coordinate all the accident prevention work of its electric, gas and transit operations. This post he still holds.

He is very active in traffic and safety matters at national, state, local and industry levels. He served two years as Chairman of the Transit Section, National Safety Council, is a Vice-President of the Louisiana Safety Association, a Director of the Southern Safety Conference and is the Chairman of the newly chartered New Orleans Chapter, American Society of Safety Engineers.

He is a Past President of the Young Men's Business Club of New Orleans, Past President of the Delta Safety Society of New Orleans and Past Chairman of the New Orleans Chapter of the American Public Works Association. He remains very active in all these organizations as well as the Louisiana Engineering Society, Tau Beta Pi, the Southern Yacht Club and the Round Table Club.

If he has a hobby other than fishing and working in his home workshop, it must be that of collecting gavels. He has one son, Arthur III, who is a senior in the College of Commerce and Business Administration at Tulane. He has a Buick and a brother (Capt. Oliver F. Naquin, U.S.N.) who has a log cabin just under the Skyline Drive in Western Virginia, and a three weeks vacation coming due.

AVINS

(Continued from page 405)

Traffic had always interested Nathan, being an ardent devotee of the automobile, and for the past twenty years he has been engaged in almost every phase of traffic engineering. In 1934, he and Gibala decided to join the "up and coming" Institute of Traffic Engineers. Shortly afterwards he was drafted on the Standards and Specifications Committee of the Institute and assisted in writing the section of the original Handbook on the Traffic Controller, and the One-Way Single Face Traffic Signal.

With the establishment of the Traffic Commission in New York last year, Gibala's transfer to the Department of Traffic Engineering, he has had to assume additional responsibilities under the title of Assistant Electrical Engineer, and is now in charge of all phases of traffic control in the Borough of Queens (pop. 1,800,000), and an "unofficial consultant" in the other boroughs.

As a diversion from traffic problems, Nathan likes music, automobile traveling, and cabinet making.

New Appointments . . .

RICHARD GALLAGHER was appointed Director of Public Works of the City of Berkeley on January 1, 1950, as a result of a competitive examination.

Previous to his association with the

City of Berkeley, Mr. Gallagher was in private practice as a Consultant in Traffic Engineering and Traffic Planning during which time he assisted many cities and private concerns in California in connection with their traffic and parking problems.

RICHARD A. OVERMEYER was appointed the first Traffic Engineer for the City of Youngstown, Ohio, on May 1, 1950. He resigned his former position as Junior Engineer (Traffic) for

the City of Cincinnati to accept the new appointment. Dick is a graduate in Civil Engineering from Virginia Military Institute and holds a Master's degree in this branch from Purdue University. He completed a year of graduate study at the Yale Bureau of Highway Traffic.

HRB To Meet In January

The 30th Annual Meeting of the Highway Research Board of the National Research Council will be held in Washington, D. C., from January 8 to 12, 1951. Headquarters will be the building of the National Academy of Sciences. Program plans are well under way and an outstanding program of papers and reports on highway research subjects is assured. Details will be announced at a later date. The change from the Board's usual December meeting dates is necessary to avoid conflict with other important meetings involving highway engineers and administrators which are scheduled for December, 1950.

The group of technicians shown above are reviewing the plans for the development of an arterial route system in Albuquerque, New Mexico, in preparation for a meeting with the state highway engineer and city officials. Left to right, seated: D. Grant Mickle, Automotive Safety Foundation; James O. Granum, ASF; R. W. James, Urban Engineer, U. S. Bureau of Public Roads (Denver office); and standing, left to right, Aron Abelard, Programming and Planning Engineer, Bureau of Public Roads (Denver office); E. E. Duffy, ASF; and Gordon Gravelle, Resident Engineer, ASF. The photo was taken by Henry A. Barnes, Traffic Engineer of Denver, who visited the project to observe methods utilized in a comprehensive survey and transportation study of this nature preliminary to a similar survey in Denver.

Tests Prove Value of High School Driver Education

A recent test has "conclusively proven" the practical value of high school driver education by disclosing the fact that 1100 young drivers who received this training were involved in only one-quarter as many accidents as a random sampling of 1100 teen-agers who had not studied driver education in high school.

According to the Association of Casualty and Surety Companies' accident prevention department, which has been conducting extensive research in this field, the record of the average teen-age driver is not good, but it is better than that of the 20-24 age group.

To prove "once and for all the concrete benefits of driver education courses" now being offered in over 7,000 high schools throughout the country, a survey was made in Delaware among 2200 teen-age drivers, half of whom had been trained and the other half of whom had not. The results of the survey follow:

	Trained	Untrained
Arrests:	5.2%	24.9%
Accidents:	5.1%	22.9%
Warnings:	9.2%	31%

The First State Highway Department

Recently the general office of AASHO received an inquiry from one of the member departments seeking information on which of the states had the first highway department. Checking with competent historians, the general office came up with the following information:

The first state highway department seems to have been established in Virginia in 1816, with one Loammi Baldwin as first state engineer. The second such organization was established in South Carolina in 1817, and in Kentucky in 1835.

One of the interesting side lights on this research was the fact that the original Kentucky act passed in 1835, and amended in 1837, established a salary of $5,000 per year for the chief engineer of the Kentucky department, which statutory provision seems to have prevailed until quite recent times. This is indicative of how difficult it is to get highway engineers' salaries up.

American Highway—April 1950

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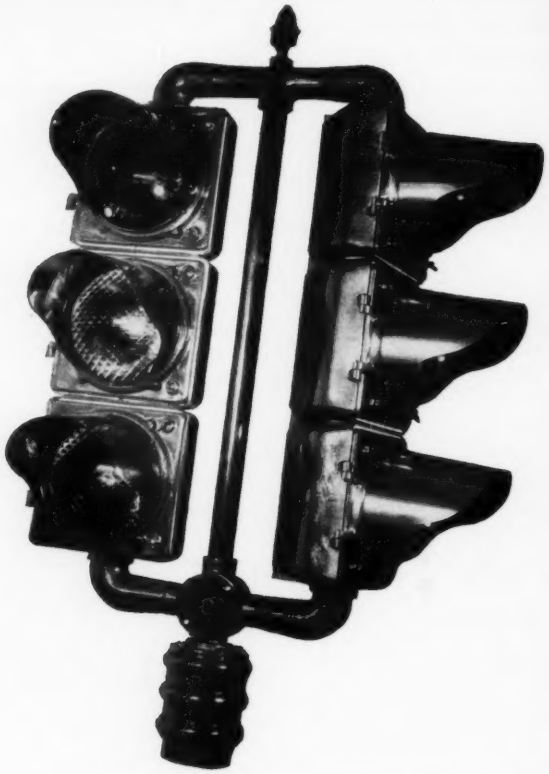

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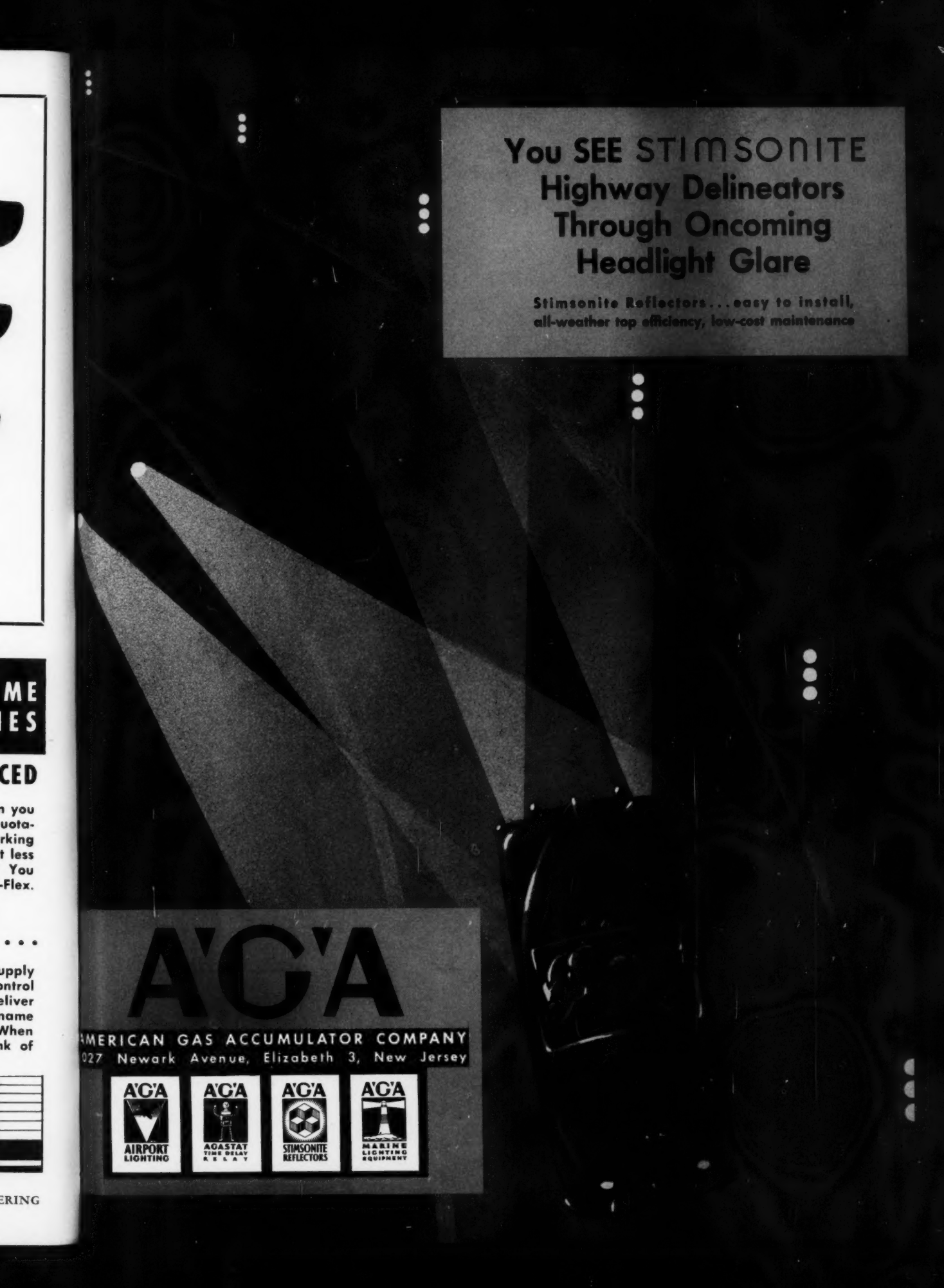
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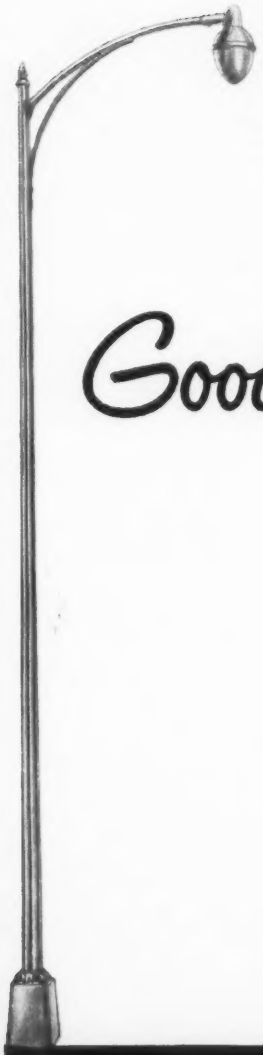

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